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Pacific MARINE REVIEW

JANUARY 1945



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Pacific MARINE REVIEW

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UBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO, 11

ntered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the t of each month. Advertising and editorial forms close on the 15th. Subscription price, one year, $1.50; two years, $2.50; ree years, $3.00; foreign, $1.00 additional per year; single copies, 25c.

NEW YORK OFFICE
Rooms 202-203, 170 Broadway
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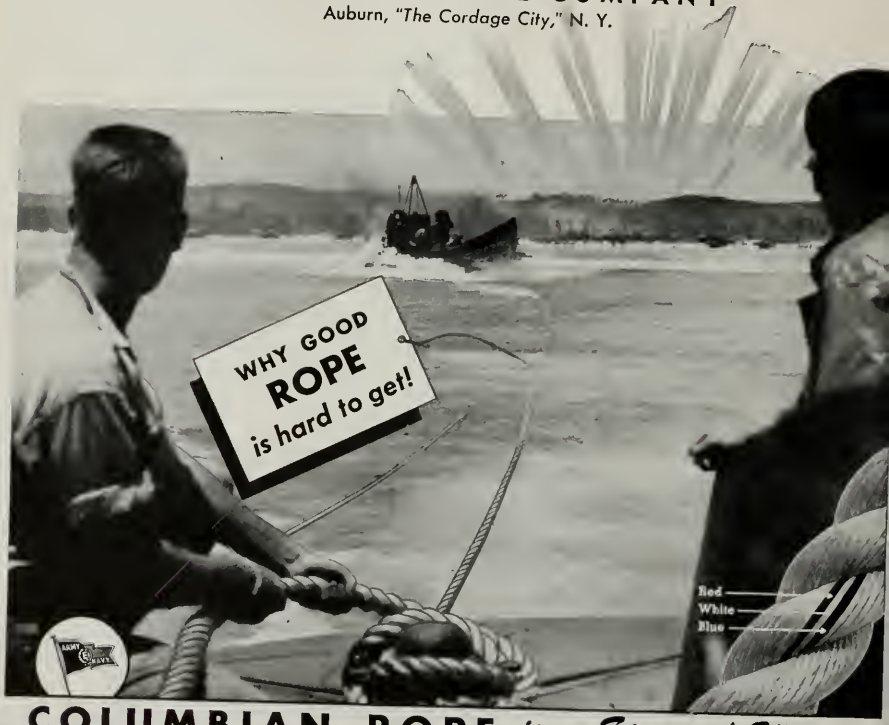
opies of Pacific Marine Review can be purchased at the following news stands: NEW YORK CITY—Times Building News tand, Inc., 42nd Street and Broadway; Harry Nash, 17 Battery St.; Philip Mandara, N. E. Cor. Battery & Greenwich. SEATTLE—Campbell Brothers, Colman Dock, 813 Alaskan Way.

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Pacific MARINE REVIEW

United Maritime Authority

At a meeting of the United Maritime Executive Board, held in Washington, D. C., late in November, there was presented, discussed and approved a report from the planning committee of the United Maritime Authority establishing machinery for the coordinated operation of United Nations' shipping in the period between the defeat of Germany and the defeat of Japan. This report has been accepted by the government of the eight nations most concerned—United States, Great Britain, Netherlands, Norway, Belgium, Canada, Greece and Poland.

This report provides two branches of the Executive Board, one with offices at Washington, one with offices at London. The board members in each branch will be one representative from each of the first four nations mentioned and one associate representative from each of the second four nations.

The report in general contemplates operation of the merchant shipping fleets on much the same basis as they are at present operated, utilizing existing shipping firms for management of the ships in routes and with ships allocated by the U.M.A. through the various national war shipping control agencies.

Arrangements are made for joint meetings of the two branches sitting as a unit to discuss world-wide problems of shipping. Each branch is to set up committees corresponding to the administrative structure of the War Shipping Administration at Washington and of the Ministry of War Transport at London. The machinery of these two agencies to be used to put into effect agreed policies. Periodic joint meetings are specified for the two committees dealing with shipping policy.

The intent of the whole plan is to provide during this period the most advantageous use of the merchant fleets of the allied nations for the defeat of Japan and for the rehabilitation of those nations that have been ravaged by the war.

Under international control of international shipping, American flag vessels would probably be allotted a larger share of the ocean cargoes originating in and destined for America than they could hope to get and hold under commercial competition with the lower-cost, lower-wage vessels of other flags. At the same time, the American flag domestic shipping, coastwise and intercoastal, could and would be built up with modern economical carriers.

This practically complete control of the world's shipping by an international authority may, if wisely directed, teach the world many very beneficial lessons of cooperative merchant marine operation. Such operation for peace time has often been advocated by the wisest of our shipping leaders. This plan is for the duration.

How long is the duration?

It is very significant in this connection that several of our Army, Navy and Marine leaders are evidently being driven to the measured opinion that before we can say Japan is defeated we must destroy every fighting Japanese man. According to Admiral Wright, U.S.N., Japanese men are coming to fighting age at the approximate rate of 200,000 a month. Our highest record of destruction in any one month thus far has been less than 50,000.

Considering all the factors involved, logistics, the fanaticism of the foe, and the exhaustion of the Allies—it would seem that the war with Japan will be much more prolonged than the war with Germany.

It is within the realm of possibilities that this international control of shipping—a long-time dream of the wisest among shipping men and of the lovers of peace—may have a period of control long enough to demonstrate its advantages to the world of business and so may become permanent in the world's economy.



Flying Cloud Hall.

Officers' School AT ALAMEDA

WHILE SHIPPING men have heard a great deal about the Officers' School at Alameda, California, few of them realize the extent and excellence of the training program and facilities. Everything has been designed with the object of training and qualifying men — who have had at least 14 months' seagoing, deck or engine room experience —for the position of third officer or third engineer.

The complete course of study has been prepared by the instructors, all merchant marine officers, who know the needs of the students as they exist today. No time is wasted; these war-designed courses are completely integrated into a four-month's course. The practical and theoretical are correlated, and all possible use is made of modern training aids, e.g. audio-sensory aids, training films, charts, records and ships' gear.

The Propeller Club members who visited the school on October 11 saw a miniature campus situated on the old site of Neptune Beach at Alameda, with the various buildings, housing the different departments and the dormitories, appropriately located on the grounds. These buildings, 22 in all, include two mess halls, the ship's galley, cafeteria, ship's service store, sick bay, auditorium, recreation halls, training basin for water safety and swimming training, and administration headquarters. The barracks buildings, housing the personnel during training, are well arranged in a series of rooms each well equipped to accommodate four officer candidates, and the athletic fields and parade ground complete the campus picture. All the buildings bear the names of famous clipper ships, the streets being named for the skippers who sailed them; the main street, however, is known as McKay Avenue.

The main engineering building contains a full-size cross-sectional example of a modern marine boiler, complete operating boiler units, a complete working miniature reciprocating marine engine, various engine room auxiliary pumps, a machine shop completely equipped with milling machines, lathes and shapers —

(All photos U. S. Maritime Service Officers' School Official Photos.)

Stage shows are popular at the school, where officer candidates are entertained by top-quality performers. This is Tommy Dorsey's band, playing from the stage of Shenondaoh Hall, the station's gymnasium-auditorium.











Upper left: Lifeboats may be used for recreational sailing at the school. Lifeboat drills are part of the training program. Upper right: Convoy procedure is one of the training courses. Many signal devices are used, including the "walky-talky" sender-receiver. Lower left: Deck officer candidates study vernier reading on the sextants during navigation and gyro-compass training. The gyro-compass is in the center, right. Lower right: Enlarged photographs and charts are used in engineering classes to aid in instruction of officer candidates. Working models are also used.

Below: Officer candidates pass in review each Saturday morning. Here a typical section passes in review following inspection.





Officer candidates singing Christmas carols around a tree against a background of a ship's clock.

all within a few steps of the classroom desk chairs.

Deck officer students gain their practical knowledge on a specially built ship's bridge, overlooking the bay, which is equipped with the steering wheel, magnetic compass, gyro-repeater, intercommunication telephone, engine room telegraph, chart tables, chronometers, fire detection system, radio direction finder and all navigation instruments. Above, on the flying bridge, there is fitted a standard compass and pelorus. Out on the water's edge there is laid out a ship's mast, with booms, hatches and the cargo-handling gear. This is complete with steam supplied to winches all arranged for actual practice in the loading and stowage of cargo. In a night vision room, ship and plane silhouettes give excellent practice to students in sighting the enemy in the darkness. Twelve lifeboats, two rafts and one launch, also docking facilities with suitable up-to-date boat davits, all provide the best practice in the use of life-saving equipment.

A typical deck officer candidate, before receiving his license, acquires an excellent working knowledge of all the above equipment, in addition to which he learns seamanship, navigation, rules of the road, convoy procedure, ship stowage, construction, first aid and so on. The mathematics involved in all the above are also appropriately emphasized.

The engineer officer candidate becomes well acquainted with the construction, operation and maintenance of the various marine propulsion equipment mentioned above. He learns about the operation of reciprocating engines, diesels and turbines; also considerable about the different fundamental laws of physics involved in their design and construction. Electricity, refrigeration, machine shop practice and mechanical drawing are all included in the course of study.

However, the recreational side is well taken care of, with movies, athletic tournaments, swimming and small boat sailing filling the greater portion of the available time.

Each month approximately 200 candidates graduate, upon passing their third officer, or third engineer's examination, and are then commissioned as ensigns in the U. S. Maritime Service. Provided an officer candidate has enough sea experience he is in line for a higher license. Each month 200 incoming candidates move in to occupy the barracks vacated by the graduates. The steady stream of men has never decreased.

The task of providing competent officers for our great merchant marine is very urgent, and through this school and others like it strategically located on the Gulf and Atlantic Coasts, that task is being accomplished in record time.

One of the more popular spots is the canteen and coffee shop in Ship's Service Store.





A modern Standard Oil of California tanker passing Mile Rock Lighthouse, San Francisco Bay.

New Developments IN TANKER DESIGN

By E. L. Stewart

THE DEVELOPMENT of the oil tanker from its very immature beginning to the present highly specialized carrier of bulk petroleum products was one of "necessity." Necessity — occasioned by the remoteness of the oil fields from home and foreign markets, the volume of the petroleum produced, and the need for a safe, practical and economical means of handling and transporting petroleum products in seagoing vessels.

At first the petroleum was transported in wooden barrels. Subsequently, to reduce the tare weight of the containers and permit of more economical stowage, rectangular prism-shaped metal containers were used. Due to the considerable leakage of petroleum from the containers —with attendant hazards of explosive gas formation, and also by reason of the relatively high cost of containers at a time when the production of petroleum was rapid—attention was directed to the possibility of handling and transporting petroleum in bulk in seagoing carriers. The structural arrangements devised and used to effect such bulk petroleum transportation were numerous and varied, until in 1886 the German-conceived and English-built tanker Gluckauf, prototype of the present-day bulk petroleum tanker, was built. Although there is a far reach from the Gluckauf, of 3020 tons deadweight carrying capacity, to the large bulk oil carriers of present-day commerce, the basic principles of general design embodied in the Gluckauf and its contemporary tankers have not undergone any material change in present application.

It would entail a long treatise to describe the transition of the tanker from vessels with propulsion machinery aft to vessels with propulsion machinery amidships and back again to propulsion machinery aft; from single deck vessels to those of two-deck "poop-bridge-forecastle" type and three-deck "flush" or "shelter" deck types, and back again to single-deck vessels with poop-bridge-forecastle; from vessels with separate expansion trunks to those with continuous expansion trunks or just access hatchways on deck; from vessels with transverse framing to those with longitudinal framing or hybrid transverse/longitudinal framing systems; from vessels with tank center line longitudinal bulkhead and topside summer tanks to vessels with twin and triple longitudinal bulkheads in cargo oil spaces; from the various developments and uses of steam reciprocating, combined steam reciprocating and exhaust turbine, geared turbine, to diesel (of four cycle and two cycle, single acting and double acting, air injection and solid injection; supercharging and non-

(Paper read before the Panel on Marine Aspect of the Oil Problem at the American Merchant Marine Conference, New York, October 18. Mr. Stewart is manager, Construction Division, Marine Department, Standard Oil Company of New Jersey.)



A Maritime Commission T-2 tanker, tubo-electric drive. *(Photo courtesy Marinship)*

supercharging), turbine-electric and diesel-electric; and from Scotch to water tubular and exhaust gas boilers.

Although such a treatise would be of historical interest and perhaps be especially intriguing to persons directly interested in tanker construction and operation, it would prove of little value in a practical consideration of the present-day tanker. In entering into such a consideration from the viewpoint of "New Developments in Tanker Design Especially as They Affect Speed and Transportation Costs," it is recognized that there can be many shades of opinion as to whether or not the present-day bulk oil carrier embodies those features or developments which should provide a safe, practical, economical and readily maintained tanker to fill the needs of all normal services. These shades of opinion, however, are generally associated with the requirements of special or "tailored" services peculiar to the operations of individual operators and companies.

Analyzing the economic significance of some of the present developments in the design and operation of seagoing bulk oil carriers, there are certain influencing factors upon which an agreement of opinions should obtain. Amongst such influencing factors are those related to the gradual increases which have been made in the deadweight carrying capacity and sea service speed of tankers during the past two decades. The gradual improvement in the design of the hull structure, hull form and its appendages, propulsive equipment and hull engineering items, with resultant relatively large decreases in the weight thereof, has made it possible to obtain an attendant gradual increase in deadweight carrying capacity and in sea service speed.

The increase in speed occasioned very close study of hull form and propulsion, and the resultant "fining" of tanker lines has permitted the present-day tanker to maintain speed in heavy weather. It is obvious that an increase in the sea service speed of a large tanker has a greater influence on the average speed of transportation of petroleum products than a like increase in the speed of a smaller tanker in the same service. Constant efforts are being made to minimize the cost per cargo deadweight ton per mile for the transportation of the petroleum products carried and to obtain a maximum return on the capital invested in the vessel.

Compatible with the port facilities and the shoreside oil handling facilities involved, the average size of tankers as to deadweight capacity and cargo volumetric capacity has been gradually increased over the average size of tankers built ten years ago. In this connection it is of interest to note that the world average deadweight carrying capacity of tankers built in 1930, principally motorships, was about 12,300 tons and the average speed about 11¼ knots.

The present-day tanker construction embodied in the Maritime Commission Tanker Building Program indicates an average of slightly over 16,600 tons deadweight capacity per tanker and a speed of slightly over 14½ knots.

As of September 30, 1944, the program of Maritime Commission tanker construction included contract groups comprised of 446 tankers contracted for and about 312 tankers delivered, of the types designated T2-SE-A1 and T2-SE-A2. Such types of tankers are rationalized commercial vessels having the same hull characteristics—symbolized by T2; like form of single-screw steam turbine electric propulsion—symbolized by SE; but different power of propulsion—symbolized by A1 for installation with propulsion motor capable of developing about 6600 shp at 93 rpm; and A2 for installations capable of developing about 10,000 shp at 106 rpm. Of the two types the contract groups embody 406 vessels of the A1 symbolization and 40 vessels of the A2.

The Maritime Commission's construction program has also included contract groups comprised of 15 tankers contracted for and 14 tankers delivered, of the type designated T3-S-A1, which in general is a geared steam turbine propulsion powered contemporary of the steam turbine-electric propulsion T2-SE-A1 tankers. In view of the preponderance of tankers constructed and delivered since the beginning of 1942, being of the Marcom T2-SE-A1 type, and by reason of the same hull form characteristics having been embodied in two other differently powered designs of privately constructed contemporary tankers, it is thought that a comparison of such designs is especially pertinent to the subject.

The three designs embody the use of fluted bulkheads in cargo oil tanks, and are of the single deck poop-bridge-forecastle erections type, with twin longitudinal bulkheads in the cargo tank body, and bracketed lon-

gitudinal framing of shell and deck. While the T2-SE-A1 tankers are entirely of welded construction, the other two designs employed riveting in the seams of the side shell plating and upper deck plating—the butts were welded. The T2-SE-A1 tankers have no sheer of upper deck but are of increased molded depth, resulting in practically the same summer freeboard draft as that which obtains for the other two designs having a parabolic sheer of upper deck. The details of other features such as tank body disposition and volumetric capacity, location of cargo oil pump room, semi-bulbous bow, cruiser stern, are quite comparable in all three designs.

The propulsion power installations are, however, entirely different in the three designs — the T2-SE-A1 type have a 6000 shp (normal) at 90 rpm steam turbine electric installation, while the other two designs each have a geared steam turbine installation, one design having 4000 shp (normal) at 85 rpm, and the other design having 9000 shp (normal) at 90 rpm. Under certain conditions of propulsion power operation, as presently authorized by the War Shipping Administration, the motor of T2-SE-A1 tankers may be operated at about 7600 shp and 97 rpm. The average sea service speed and the corresponding "all-purpose fuel oil consumption" per 24 hours, for each of these comparable designs, should be: for the geared steam turbine vessels, 13 knots—203 barrels and 16.5 knots—415 barrels; and for the steam turbine electric vessels, 14¾ knots — 311 barrels and 15.3 knots—348 barrels.

Further comparison of these three designs, as to their relative deadweight capacity and ratio of deadweight/displacement, at International summer freeboard draft and with vessels devoid of any national defense features, is:

4,000-shp vessel..16,725 tons and 0.767 ratio

6,000-shp vessel..16,765 tons and 0.766 ratio
(Without Upper Deck; Under-deck Supplementary Girders)

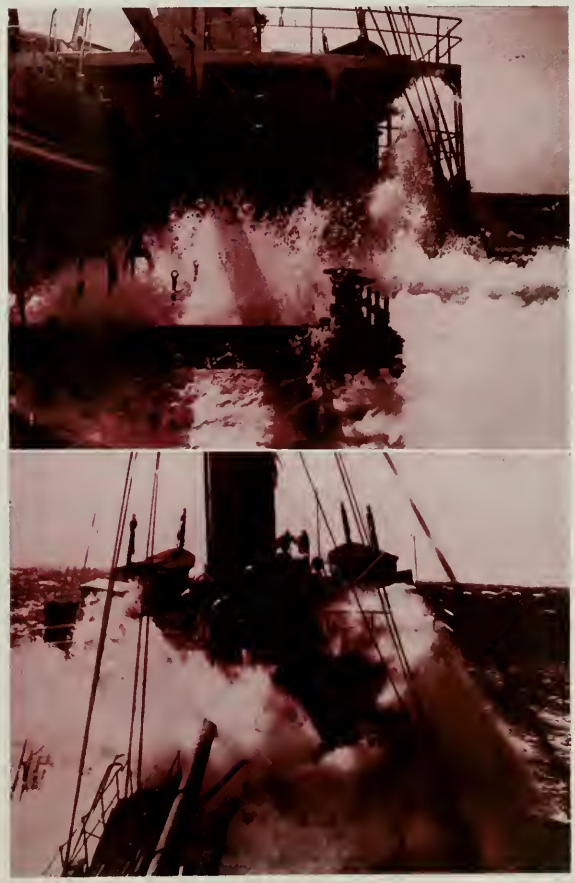
6,000-shp vessel..16,610 tons and 0.759 ratio
(With Upper Deck; Under-deck Supplementary Girders and modified After Accommodations)

9,000-shp vessel..16,585 tons and 0.759 ratio

In the case of the geared steam turbine propulsion designs, the increase in power from 4,000 shp to 9,000 shp resulted in an increase in machinery weight of about 12½ per cent and an increase in cost of about 10 per cent of the construction cost of vessel. The increase in speed of about ½ knot for the T2-SE-A1 tanker is the result of relaxation of design rating and minor changes in the steam turbine unit.

Quantitative analysis of the effect of speed changes in these designs depends upon the evaluation of all items to meet the operating and cost structure peculiar to each operator; it should, however, be possible to operate and maintain in operation such vessels at their higher speeds and, in doing so, reduce the "cost per cargo deadweight ton per mile" in the order of several per cent.

The low freeboard of tankers demands extreme precaution in designing deck fittings for water tightness and affords opportunity for fine sea action shots.



Salvage



View in drydock looking into the hole caused by torpedo explosion.

Some time ago, about 5500 miles southwest of San Francisco in the South Pacific the W. S. Rheem, a Standard of California tanker of 10,972 tons, was torpedoed by a Jap submarine, and a hole, large enough to admit a locomotive, blown in her hull on the port bow. Quick action by the master of the ship, Captain G. A. Johnson, in maneuvering his ship to elude the first two of three torpedoes, is credited with saving the tanker from going to the bottom.

The impact was accompanied by a tremendous explosion, so powerful that the ship began to buckle and the deck plates amidships showed large bulges. However, a quick appraisal of the damage convinced the captain that while the forward hold was filled with water, which fortunately had extinguished the fire in the lubricating oil cargo there, the forward bulkheads seemed to be holding enough to keep the ship buoyant. After some forward cargo had been transferred aft, and with the ship down by the head from a draft of 27'6" to 41 ft., the captain and crew eventually delivered practically all of the cargo to its destination for the U. S. Navy. Emergency repairs were then made and the ship proceeded to the San Francisco yard of Bethlehem Steel Co., where she was built in 1922.



Another view looking directly into hole from outside.

On her arrival there the vessel was docked in the new sectional floating drydock for survey and repairs.

The hole in the hull from the torpedo explosion was about 60' by 30' in size, and all the structural members, including the center vertical keel, were either destroyed or damaged in such a manner that in order to support the forward part of the ship in way of the damage it was found necessary to adopt the very unusual procedure of shoring from the bottom of the dock to the main deck with 16" by 16" timbers for a considerable distance. The bottom shell was cracked amidships, from the keel to the port side of the bilge, and the two top strakes of the centerline bulkhead were disturbed from the midship house aft to the fireroom bulkhead. Deck plates were buckled somewhat from the bow to the forward end of the after deck house; the buckling showed evidence of a diagonal strain or twisting of the hull structure from the port bow to the starboard quarter.

In the meantime the whole damaged area was laid down in the mold loft, and before the damaged steel was cut away at the ship the new material was alongside the dock ready to be erected and riveted in place.

It was found necessary, in way of the torpedo damage, to renew 38 shell plates, with all the necessary longitudinals and brackets; also four deep transverses from the main deck to the keel, and 45 feet of the center vertical keel. The center line, cofferdam, and pump room bulkheads forward with deck plating and longitudinals in way of the damage were all renewed and replaced. All pumps, cargo piping valves and operating gear in this vicinity had to be renewed.

It was also disclosed that at the time of discharging of the oil cargo at the South Pacific port the deck and longitudinal structure amidships had buckled as much as 18", but on the arrival of the ship at the drydock this buckling had been reduced to about 4". This condition necessitated the removal and renewal of some cen-

and Repair of the W. S. Rheem

terline bulkhead, and shell plates with attached longitudinal framing—32 plates altogether. A considerable amount of cargo and steam smothering lines, with their accompanying valve equipment, had to be renewed or replaced as found necessary throughout the ship.

The total cost of the repairs was about half a million dollars, and the drydock job was completed in 23 days, a very creditable achievement. The fact that the ship, a 22-year-old tanker, while in such a strained and damaged condition, delivered her cargo and then made her home port speaks well of the type of men who navigate and man our ships. The builders are also to be congratulated on the superb performance of another Bethlehem-built ship.









Upper left: Looking from main deck down towards hole.

Upper right: The waterline at which she floated after being damaged is fairly well delineated, beginning near the top of the hawse pipe.

Lower left: View from inside, showing damaged material being cut away and shoring being inserted from main deck to bottom of drydock.

Lower right: Inside view, showing some of the shoring timbers in place.

Oil Transportation by Tanker

By J. J. Coney



For safe passage over the low freeboard decks all modern tankers are fitted with these "catwalks."

History

THE FIRST transportation of oil on ships was in wooden barrels. This method was followed by case shipments, which showed considerable improvement inasmuch as cases packed closer than barrels, resulting in lower freight costs. However, both of these methods had the disadvantage of leaks, with consequent loss of oil and claims for shortage, as well as the generation of dangerous gas in the hold of the vessel, requiring only a spark to set it off.

Further study of the situation led to the idea that the vessel itself should be fitted with iron tanks, into and out of which the oil could be pumped. This system showed considerable economy over the old barrel and case methods, due to quicker loading and discharging, but the leakage of the oil, although less, was not eliminated, and still generated a dangerous gas which filled the spaces between and beneath the tanks and the hull of the ship. Repairs could not be made—electric lights had not been introduced—and hot rivets could not be driven until the gas in the hold of the vessel had been eliminated, incurring great delay and considerable expense.

The next development brought the modern tank vessel, credit for which must be given to the late Wilhelm Riedemann of Hamburg, who conceived the idea of carrying oil in bulk to the skin of the ship. In 1880 he bought a large sailing vessel, the Andromeda, which had been built originally in 1864, during the Civil War, as a warship for the Northern States. Before completion of the vessel the war came to an end and it was sold to an English firm, but lay idle for a long time.

Upon being purchased by Mr. Riedemann he put it to various uses, among others, the importation of petroleum. The vessel had a large cylindrical water tank which went through the various decks, practically from the bottom of the vessel to the upper deck. Since it was no longer used as a water tank, Mr. Riedemann thought of filling it with oil, which practically started the idea of a tank vessel. When the Andromeda returned from a trip around the world in 1883-85 it was put into a shipyard at Germany and fitted with 40 steel tanks connected together by pipelines. This enabled the vessel to carry about 2700 tons. Before the installation of the tanks she was able to carry 12,000 barrels of oil, while the capacity after the tanks were installed was 17,000 barrels, showing a gain of about 42 per cent in carrying capacity.

In August, 1885, the work was completed and the vessel sailed on her first trip, the result of which was so highly satisfactory that Mr. Riedemann immediately conceived the idea of building a steamer for the exclusive purpose of carrying petroleum in bulk. No shipyard in his own country would take up the crazy idea, and discussions with shipbuilders, in practically every instance, resulted in an attempt on their part to dissuade him. However, he finally got an English firm on the Tyne to undertake the same and the result was the construction of a tank steamer of 3400 tons carrying capacity, which was completed in 1886. This vessel, the Gluckauf, was 300 feet long and carried approximately 25,000 barrels in bulk. The success of this vessel resulted in the immediate construction of others, and by 1892 Mr. Riedemann's fleet alone consisted of 12 tank vessels. The original vessel, the Gluckauf, had longitudinal and transverse bulkheads, so can be considered the prototype of the modern tanker.

The first American bulk tank steamer, the SS Standard, was built in 1888 by John Roach, Chester, Pennsylvania, for the Standard Oil Co. The first oil tanker on the Pacific Coast was the George Loomis built by the Union Iron Works in San Francisco in 1896, for the predecessor company of the Standard Oil Company of California. This was

(Address before the Propeller Club, Port of San Francisco, November 15, 1944. The author is president of Deconhil Shipping Co.)

very small ship with a carrying capacity of 6500 barrels.

Development and Design

The first tankers were built with the machinery amidships, and a large number of them were freighters that were converted by having the tanks built into them. It was some time before the machinery was moved aft, which eliminated the difficulty of keeping the shaft alley tight in the after tanks. All of these ships were built on the transverse system of framing and most of them were fitted with centerline bulkheads and summer tanks. These summer tanks were located in the upper outboard edges of the main tanks. This arrangement had a twofold purpose: (1) To cut down the surface area of the tank so as not to impair stability with too great a free surface area when rolling in a seaway; and (2) to allow for loading the main tanks completely with heavy oil without sacrificing the reserve buoyancy. The name "summer tank" came about through the fact that these tanks were seldom loaded except when the ships were proceeding at a summer draft.

Shortly before the first world war the longitudinal system of framing was introduced, and this has become the standard for tankships since that time. The modern large tanker has two longitudinal bulkheads without summer tanks and is of welded construction.

The adoption of the welded construction has materially increased the speed with which a tanker can be built, as well as increasing the carrying capacity because of reduced weight of the hull.

Increase in Size and Speed

Tankships have greatly increased in size and speed. The average tankers built during and after the first world war were of 10,000 tons dwt. and 10-knot speed, while today the average tanker is 16,500 tons dwt. with a 14½-knot speed. Great advances have also been made in the type of machinery used and the overall efficiency of the same. Most of the first tankers used reciprocating engines, then geared turbines, and now turbine electric drive. Some installations have been made of diesel electric and straight diesel drive, but these latter have not been as popular with the American shipowners, except for long offshore runs. However, the straight diesel drive has found much favor with foreign tankship owners, especially the Scandinavians, as practically all their ships are driven by this type of machinery. The overall efficiencies of the propelling machinery have been increased so that practically half as much fuel oil per hp. hour is now used as was used on the vessels built during and shortly after World War I.



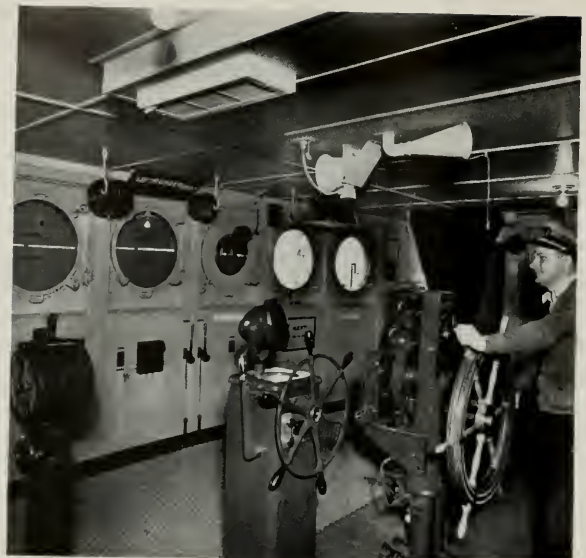
Crew's quarters on modern oil tankers are the acme of sea comfort.

Operations of a Tanker

One of the greatest costs in tanker operations is the rapid wasting of hull structure, due to certain products carried. Many attempts have been made to minimize this by the use of coatings of every kind and description—by filling tanks with inert gas to displace oxygen; by cleaning the tanks immediately after cargo has been removed; and by spraying molten metal on with metal spray guns. All of these attempts so far have proved either ineffective or too costly. One small ship built recently was lined entirely with sheet nickel and, although this successfully combated the erosive effects of the cargoes, the additional weight and cost could not be justified. As a consequence, in the design of a tankship, all plating and sections of ships are made considerably heavier than strength requirements alone would necessitate, so that the ship will still have sufficient strength to carry on when a considerable portion of its structure has wasted. There is room for improvement along this line in the tankship of the future, and there is now a proposition on foot to make tankship plates with a mild steel core and fuse in thin nickel bearing metal sheets while the plate is being rolled in the mill, making, in effect, a laminated plate or sandwich with mild steel core and stainless steel surfaces.

However, it would seem to me that the solution would be the development of a rust-resisting steel that was of the same material throughout, and that would have higher tensile strength than the ordinary steel with the cost of manufacture not being too much above that of the present steel.

The operations of a tankship require the carriage of a great number of different commodities, or grades of petroleum products, oftentimes on the same ship. It is necessary, therefore, that the crew be very conversant with the miles of pipeline and the hundreds of valves that are installed throughout the ship and the pumproom, so that there shall be no commingling of the various com-



The tanker's bridge is equipped with all the modern aids to safe navigation.

modities in the handling of the cargo. And, as these various products have a considerable variation in weight, it is necessary when carrying a cargo of assorted products to plan the loading of the ship very carefully, both for trim and to minimize any chances of commingling. Incidentally, one of the interesting things about loading a tanker is the fact that oil is loaded into the ship "hot" and, although it is the rule that no cargo shall be accepted at a higher temperature than 125°, sometimes this temperature is considerably exceeded. It might be interesting to note that a 500-foot ship expands from 12 to 14 inches in length before and after loading cargo, due to increase in temperature alone.

Cargo Pumps

The pumping facilities of the modern tankship, together with the increased shore facilities, allow for the loading or discharge at the average rate of 3000 to 5000 barrels of cargo an hour. In some instances, where special equipment is installed for rapid receipt of cargo ashore, as high as 18,000 barrels an hour have been discharged. This requires the crew to be alert at all times, especially in loading, as at this rate a ship's tank fills very rapidly, and if the crew is not careful a spill will occur which may result in heavy penalties, as the Coast Guard and the U. S. Army Engineers are very strict regarding pollution of the harbors. This is especially necessary due to the fire hazard of oil on water, as a barrel of gasoline will cover a wide area on the surface and will burn with an intense flame. On the other hand, black oil coats the piling and understructure of docks and creates a very grave fire hazard. The tanker operators and crews have become so expert and careful, however, that a spill in loading very seldom occurs.

One of the main differences between the operation of the dry cargo ships and oil tankers is the fact that the dry cargo ships have stevedores load and unload their cargoes, while the ship's crew does this on tankers, and the necessity for having the ship's crew, who are familiar with the ship and its valves and pipelines, do this is readily evident when you consider the rapidity with which the cargo is put aboard.

Usually if more than one commodity is loaded two hoses are used, but on occasion a greater number are used. The hoses through which cargo is loaded or discharged are reinforced rubber with synthetic rubber lining, and operate at a pressure not to exceed 100 pounds per square inch. Prior to the war the average time that a tanker was in port for either loading or discharging was 36 hours. However, this has been somewhat increased due to war regulations, congestion in the ports, and in some instances convoy delays. Due to this short stay in port, sea watches are not broken while in port and, consequently, port liberty for tanker men is considerably less than for dry cargo ship crews, which break watch on arrival in port and turn over the cargo handling to stevedores.

As a tanker's operation is ordinarily based upon one leg loaded and the return in ballast, one of the major problems in quick turnaround is the disposal of contaminated ballast. This is somewhat overcome with the use of the high pressure Butterworth System, which uses high pressure hot water pumped through revolving spray nozzles, which are lowered into the cargo tanks for washing them down. If the return voyage is long enough, all of the tanks can be cleaned sufficiently so that the ballast water can be pumped overboard without polluting the harbors, but, in any case, at least leaving the contaminated ballast water confined to one cargo tank. A tanker always tries to eliminate most of its ballast water at sea before reaching port, but, of course, under certain conditions of the weather this is not possible.

Safety

Close cooperation between the tanker owners, the governmental agencies, and the crews themselves, has resulted in bringing down the dangers of carrying a very inflammable and highly explosive cargo (which, strangely enough, is more dangerous when the tanks are empty than when full) to a position where it is safer to be a member of the crew on a tanker than on a dry cargo vessel. This is borne out by the records of the National Safety Council during the last three years, where the rates for tankers for severity of accident were 1.83% as compared with those for cargo ships of 2.03%; and for frequency — for tankers 17.34% as against 21.91% cargo ships. This is an enviable record, and the operators and the terminals where the tankers dock, as well as the tanker

ews themselves, deserve a great eal of commendation.

As an incidental sidelight of tanker perations, it might be interesting to ote that transportation of oil by ankers is the cheapest method of ransporting oil. As a comparison on cost per ton mile basis:

Marine tankers	.00063 cent
Railroad by tank car	.01640 "
Motor truck	.04873 "
Pipeline—Crude oil	.00477 "
" Gasoline..	.00527 "

This recapitulated: Truck transportation cost is 3 times that of rail; rail ransportation in turn costs more han 3 times that of the pipelines; while the pipeline cost is over 8 times hat of tanker water transportation.

Use of Tankers in the War

The United States tanker fleet has een supplying the Allied Forces hroughout the world—the Atlantic, he Mediterranean, the Indian Ocean, nd the Pacific—and if it weren't for he efficient operation of these ves- els it would be impossible to main- ain the great fleet of airplanes in all f these theaters, or the motorized ransports. Neither would the navies e able to carry out their far-flung perations. The WSA has announced hat the tanker fleet of the U. S. has noved 9.3 million long tons into the arious theaters of war during the irst 6 months of 1944, as compared vith 6.7 million during the first half f 1943. The transportation of such remendous quantities to ports scat- ered throughout the world calls for rganization and administration of he first order, and has only been chieved by full coopcration and eamwork between management and abor.

Tankers have not only been used or transporting petroleum products ut have been used as floating stor- ge at the very edge of the battle reas. The quick turnaround of the anker fleet has enabled the great ontinued operations of our Pacific leets, which have been able to carry n continuous operations without aving to return to their bases. In act, most all commercial tankers ave occasion to fuel other ships, as well as warships, at sea, which is something beyond the usual training f a tanker crew, and, notwithstand- ng, this has been accomplished with great success.

The tankers have also, with the use of light so-called Meccano decks, been able to transport tremendous quantities of airplanes, PT boats, landing craft, trucks and other materiels of war to the various theaters of operation. The magnitude of this cargo can be realized from the statement of Admiral Land in his report to the President regarding the activities of WSA, disclosing that during 1944, in one month alone, 15 million cubic feet of additional dry cargo was carried out of the Port of New York, and that an additional 5 million cubic feet was shipped from the Pacific ports, in addition to the ordinary oil cargoes carried.

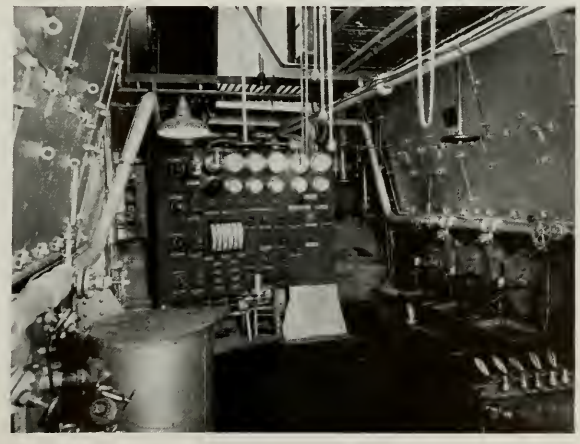
At the outset of the war the whole oil industry, which includes the great majority of the tanker owners, by pooling their resources and their personnel, made for a smooth-running operation for supplying both the domestic requirements and the overseas requirements of the Government and the civilian population. One of the major contributions of the tanker owners to the war effort has been the loaning of their expert personnel as Tanker Expediters, distributed throughout the various ports of the world. The improvement in the turnaround of tankers at these ports abroad, as the result of the aid rendered by these expediters, has played an important part in the prosecution of the war. When the whole story has been told, after the war is over, I hope that they will be given the appreciation which they so well merit.

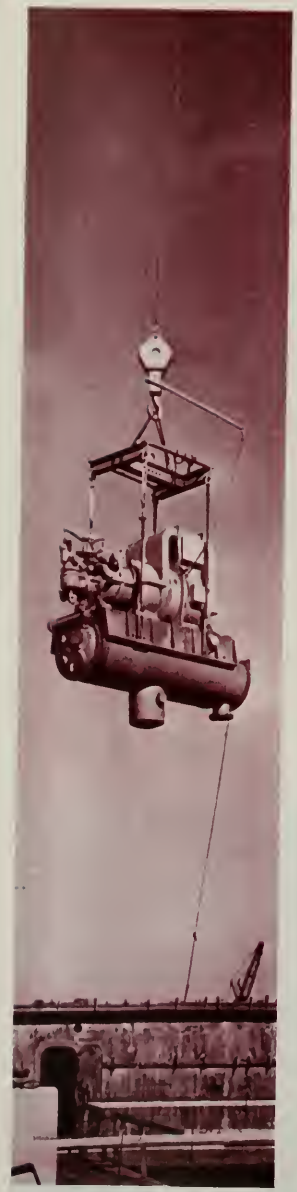
Post-War Outlook

As there are approximately the same number of tankers now as there were before the war, and as they are now being built at a tremendous rate, it is inevitable, when the increased size and speed of the present fleet is taken into consideration, that there will be a great surplus of tanker tonnage. A whole lot will depend upon the policies of the Federal Government as to the disposition of these ships, and as to their return to private ownership, as to what the outlook for the tanker industry will be. However, when it is considered that a number of Swedish concerns have offered large 16,000- to 18,000-ton motor tankers for long-time charter at a rate of $2.10-$2.50 per dwt. per month, and it is realized that it will cost us almost twice this much, with efficient operation, to operate one of our T2's in foreign trade, it will require all the ingenuity and enterprise of the American tanker industry to maintain its present position in oil transportation after the war.

However, if we can have the same united effort between Government, management and labor in the postwar period as we are having during the war, I believe we can surmount our difficulties and keep our place in the world tanker trade.

The efficient steam generators of tankers are usually governed by automatic combustion and feed water control as shown here.





Lowering completely-assembled propulsion turbine-generator-condenser unit into vessel.



Turbine electric transport of Maritime Commission BD-1 Class, built by Consolidated Steel Corp., Wilmington, California.

Electric SHIP PROPULSION

By H. C. Coleman

WHILE the application of electrical equipment for the propulsion of ships had a very humble beginning many years ago and progress was slow at first, its use has been extended greatly, particularly in the last 20 years, so that now this method of propulsion is an important factor. It is the purpose of this paper to classify the various types of electric propulsion systems, outline briefly the fundamental component parts and scheme of operation, and indicate the present trends and the possible future developments.

From the viewpoint of the electrical engineer, electric propulsion systems fall into two classifications, namely, (1) direct current propulsion, and (2) alternating current propulsion. We have two subdivisions under each of these, depending upon the type of prime mover used, namely, diesel electric propulsion and turbine electric propulsion.

We find that by far the greatest number and variety of installations have used direct current transmission. The fundamental reasons for this are to be found in the inherent characteristics of superior torque performance and greater control flexibility, refinement, and economy of the direct current transmission as compared with the alternating current. Part of the greater control flexibility

(Abstract of an address delivered on December 8 at Oakland, California, before a meeting of the American Institute of Electrical Engineers. The author is manager, Marine Engineering, Westinghouse Electric and Mfg. Co., East Pittsburgh, Pa.)

bmes about because of the fact that here is no fixed speed ratio between he prime mover and propeller as here is with the alternating current ystem, so that the ratio may be adjusted by controlling the excitation f the motor and the generator.

Diesel Electric D. C.

The diesel electric d. c. propulsion lant would normally include two or nore engine-driven generators, a ropulsion motor, a source of excitaion power, suitable control equipnent, connecting cables and certain uxiliaries. If applied to a multiple-crew vessel, a similar plant would e provided for each propeller. In ome installations, two or more moors may be connected to the propeller through gearing.

The control system used on most propulsion systems of this type is xceedingly simple, and is known as he variable voltage system. The enerators and motors are of the hunt wound separately excited type vith the field excitation supplied rom either small exciters driven by he main engines or the constant voltge ship's auxiliary power bus. The propulsion motor field is excited at a onstant value, while the excitation of he generator fields is varied from ero to full value in either direction y means of a simple control device. Thus the output voltage of the gener-



Engine room propulsion control cubicle for turbine electric Coast Guard Cutter.

ators applied to the propulsion motor s simply controlled both as to intenity and direction, thus controlling he speed and direction of rotation of he motor. On modern installations sing high-speed engines, the speed ontrol on the propulsion motor is btained partly by this variable voltge control system and partly by a ertain amount of control of the engine speed, which of course also affects the generator output voltage.

Turbo-Electric

In the direct current turbine electric system the electrical equipment and method of control is exactly the



Two direct current propulsion motors on diesel-electric lighthouse tender Juniper.



Pilot house on the Juniper, showing new type control desk.

same as for the diesel system, with the exception that the generator operates at constant speed, since this gives the best performance of the prime mover. In this system a high-speed turbine with a reduction gear is substituted for the diesel engine, and of course a boiler plant together with the necessary condenser and auxiliaries are required.

Alternating current equipment is very desirable for electric propulsion from the standpoint of minimum size, weight, cost, maintenance and simplicity. However, for vessels of relatively small power and special service, these advantages are overbalanced by the greater control flexibility and better performance of the direct current equipment. Thus alternating current propulsion is most adaptable to ships requiring considerable power.

The turbine electric a. c. propulsion plant would comprise a boiler plant, a single high-speed, variable speed, non-reversible steam turbine driving a direct connected propulsion generator, a condenser, a propulsion motor, a source of excitation power, control equipment, connecting cables and certain auxiliaries.

The modern alternating-current turbine - electric propulsion plant makes use of synchronous generators and synchronous propulsion motors with heavy pole face or damper windings especially designed to provide the necessary maneuvering characteristics. The motor and generator operate at approximately unity power factor over the entire speed-load range. Speed control of the propeller is accomplished entirely by varying the frequency, which means varying the turbine speed.

The control equipment provides three main functions: (1) control of the turbine governor in order to obtain various speed settings, by means of a simple lever and mechanical connection; (2) control of the circuit from the motor stator to the generator stator and for interchanging two phases of this three-phase connection for reversal, by means of air-break contactors operated by cams from a lever; and (3) connection of the generator and motor field circuits to the excitation power source, by means of contactors operated by cams from a lever.

In starting the ship from rest, the turbine speed is adjusted to the idling position, usually about 25 per cent of full speed. The circuit from the motor stator to the generator stator is closed with no excitation on the motor field, this being short-circuited through a fixed resistance, and at the same time applying heavy over-excitation to the generator field. The motor starts as a squirrel-cage induction motor, operating on the damper windings. It quickly accelerates to a speed nearly synchronous with that of the generator, and is then synchronized by applying field excitation to the motor. The generator excitation is then reduced to normal.

Excitation power is usually taken from the ship's auxiliary power bus or from a special exciter driven by the same prime mover which drives the ship's auxiliary power generators.

Progress in Development

In the early development of this type of propulsion, wound rotor motors, together with the attendant complicated and heavy control, were utilized, along with comparatively slow speed heavy turbine-generator sets operating at about 30 cycles. Development progressed through the stage of the squirrel cage motor and finally to the synchronous motor with simplified control and smaller and lighter turbine-generator sets. During the last 15 years, many developments have taken place which have greatly improved this type of propulsion equipment. The art of welding has been utilized to a great extent in practically all parts of the machinery with a considerable saving in space and weight. Methods have been worked out so that the operating speeds of the turbine-generator sets have been materially increased, some modern units operating at 90 cycles. This has afforded a great saving in space and weight. As in the case of direct current equipment, improvements have been made in the ventilating systems and in the application of insulating materials of higher grade. Through experience, testing and research, a very much better knowledge has been obtained of the actual performance characteristics of propellers and types of vessels, so that the electrical equipment can be better designed to fit the actual conditions. In the early installations, the electrical equipment was designed with sufficient inherent torque margin to provide stability in the system under maximum conceivable conditions. This meant large and heavy equipment. In recent years, systems have been developed to provide automatic stability control in the electrical system so that the over-excitation required during peak load swings is applied automatically and only during the period needed. This enables the designer to save weight and size on the apparatus. Another means of saving in weight on the machines is the use of dynamic braking to stop the propeller in reversing. By means of suitable resistors and con-

trol connections, the return energy of the propeller during reversing is absorbed externally to the machines.

Diesel-Electric A. C.

The alternating-current diesel-electric system comprises a list of component parts similar to that given for the direct-current diesel-electric drive. However, the operation of the system is entirely different, and is comparable with the alternating-current turbine-electric drive. The fundamental principles of speed control and reversal of the propulsion motor are exactly the same as described for turbine - electric alternating - current drives. The main difference is, of course, that with the diesel-electric system several prime movers are used, which makes necessary the parallel operation of the generator units on the propulsion motor bus over a speed range of about 25 per cent to full speed on the engines and with varying load. Also, means are required for switching and synchronizing the propulsion generators. However, only the actual connection switches are used, as no elaborate synchronizing devices such as are necessary in a power plant on land are required.

Because of the limited torque capacity of the diesel engine at idling speed, special precautions are necessary in the control equipment to control the torque.

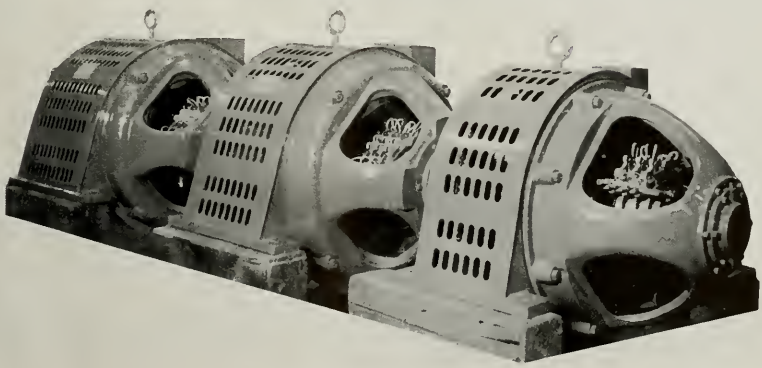
This alternating-current system is the most recent type to receive serious consideration. Considerable development was carried out in Europe in the period from 1936 to 1939, and five vessels were built, the later installations utilizing synchronous motors. The first development in this country started in 1939, when a very special plant was installed in a tuna fishing boat at San Diego, California. This plant consisted of three diesel-driven generating units operating on a constant frequency bus which supplied both auxiliary power and power for a tandem arrangement of three wound rotor induction motors driving the propeller through a reduction gear. The three motors were of different capacity and pole combinations, so that three basic speeds were obtained when operating from the constant frequency 60-cycle ship's bus. The only other installation in this country was made in 1941 on a large twin-screw naval vessel. The plant included two 5900-hp direct connected synchronous motors and eight diesel-driven generating sets. Both of these installations have given excellent service, and the experience gained in designing, building and operating these equipments leads us to the conclusion that these systems are entirely satisfactory for vessels of this class and ships of similar power requirements.

Looking to the future, we believe that the diesel-electric system with direct-current equipment will continue to be a favorite form of drive for special classes of vessels normally requiring considerable maneuvering, and that the alternating current drive will be utilized on vessels requiring a considerable amount of power and infrequent maneuvering. Developments on the diesel engine prior to and during the war have led to higher speed and lighter weight machines which can most conveniently be applied to ship propulsion in multiple units by utilizing electric transmission.

It is believed that the turbine electric system will find its field of application mainly on vessels of special requirements where, for instance, the auxiliary power load in port is an appreciable percentage of the total power of the propulsion plant, so that the main generator may be used for this supply; also possibly on large passenger or combined passenger and cargo vessels and wherever operating conditions dictate the need for full power astern when maneuvering.

Manufacturers are constantly conducting studies, tests and research in an effort to improve the equipments, decrease size, weight and cost, and to improve performance. It is hoped that this work will produce improved systems. The most hopeful outlook appears to be in the utilization of improved materials. These may include better magnetic materials, and particularly better insulation materials, such as glass and the new synthetic inorganic varnishes, which will permit operating at considerably higher temperatures than now used. After the war there should be an ample supply of aluminum and magnesium at reasonable cost, and it should be possible to utilize these materials more extensively to reduce weights of equipment.

Tandem wound rotor propulsion motor unit for diesel-electric alternating current drive on tuna fishing boat Challenger.



Ships



Combat loaded transport on the ways ready for launching at a California yard.

The United States is now in the fourth year of total war. December 7, 1944, marks the beginning of what every American hopes and prays will be the last year of this battle of death and destruction.

The year 1944 has been another glorious page in the annals of American shipyards. In the years of 1942 and 1943, the cry was "ships and more ships."

The answer to that cry is carved in the sands of Africa, Sicily, Italy and Normandy in the Old World, and in the far reaches of the Pacific upon the coral reefs of Tarawa, Guam, Saipan, Guadalcanal, and, lastly, the Philippines.

That the number and tonnage of ships constructed in 1942 and 1943 under the direction of the United States Maritime Commission will never be exceeded, at least during the lifetime of the present generation, and that the records of production during this era will stand unchallenged, is the earnest prayer of all peace-loving nations the world over.

As American shipyards reached their peak of production during the year 1943, so necessarily did the types and sizes of vessels expand to almost one hundred.

As stated in our last issue, the Commission started out with five standard types on their ten-year program, and the years of 1940 and 1941 found these model vessels being placed in service in an ever-increasing number, and our merchant marine was after many, many years showing signs of awakening to take its rightful place in world trade.

The war in Europe was spreading by leaps and bounds; more and more peace-loving nations were being ground under the Nazi warlords' feet; and the now-famous Liberty vessel was sliding off the ways all along our seaboards in numbers even the most optimistic mariner never even dreamed of.

This vessel was fast supplying the need for bottoms to carry supplies to the European countries fighting for their very life and existence against the Nazi war machine; but the United States Navy was expanding by leaps and bounds, and special type vessels were needed to balance the fleet into a self-supporting, hard-hitting unit.

Navy yards were working full time on powerful battleships, cruisers, sleek, fast destroyers, submarines and aircraft carriers, so the Maritime Commission was the logical place to look for much-needed auxiliaries to the fleet.

Barely were the first keels laid for these vessels when the Japs struck at Pearl Harbor, and the sad and tragic words of "Too little and too late" were stark reality.

The need for troopships, ammunition carriers, landing crafts, floating machine shops, tankers, supply ships was upon us over night.

From the attack upon Pearl Harbor in rapid succession we saw Guam, the Philippines, Yap, Singapore, New Guinea, and the lesser islands of the Pacific overrun by the Jap hordes inflicting their torture and slavery upon country after country and island after island—the work and toil of decades destroyed in a day

These were dark days for America and the United States, but America was awakening. American shipyards once more proved, "The difficult can be done now, the impossible will take a little longer." for in May, 1942, the United States Navy made its first major strike at the Japs, who had been having everything their own way, by decisively defeating them in the Coral Sea, and on August 7, 1942, we had made the first actual landing

and Men

By Monroe Jackson

on Japanese-held territory at Guadalcanal in the Solomons. It has been a steady march, gradually shrinking the Jap back in his lair.

The task has not been easy or without losses; but at the end of 1944 the United States had the most powerful fighting force afloat, greater than the combined fleets of all the rest of the nations of the world.

Let us see just what the American shipyards, the Pacific Coast in particular, contributed to this greatest of all "First Line of Defense."

Some of the more noteworthy ships constructed are as follows:

The LST's, officially known as the Landing Craft Tanks, a vessel of 327′ 9″ length, 50′ beam, powered with two diesel engines developing 1600 hp; machinery and quarters for personnel are all aft, leaving three-fourths of the vessel for loading tanks. This vessel has two large wing doors in the bow which can be opened, allowing the bow ramp to come down so tanks can run ashore through shallow water to the beach. They have more than proved their worth in the South Pacific, Africa, Salerno, Italy, and lastly the great "D" invasion of France. Forty-five of these vessels were constructed on this coast.

Another vessel which has had a great part in the war, especially against the Nazi U-boats, are the "Baby Flattops," known officially as S4-S2-BB3. This fighting ship is 498′ long, 65′ beam, 6890 tons lightship, 10,902 tons displacement loaded,



A coastal cargo vessel.



A combat loaded transport.

A U.S.M.C. standard cargo vessel.





A C-3 cargo vessel

UNITED STATES MARITIME COMMISSION
*PACIFIC COAST DELIVERIES FOR 1944

Shipyard	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total for Year
KAI-VANCOUVER	4	4	5	5	5	6	2	0	6	9	9	7	62
KAI-SWAN ISLAND	2	5	7	6	7	6	6	6	6	6	6	6	69
ORESHIP	9	3	4	6	10	7	4	2	5	8	11	6	75
MARINSHIP	3	2	4	3	4	3	4	0	3	2	5	5	38
RICHMOND ONE	1	5	5	5	0	1	2	4	4	4	4	4	39
RICHMOND TWO	19	18	18	17	17	9	3	1	2	6	9	5	124
RICHMOND THREE	1	0	3	2	3	1	1	0	2	0	0	1	14
RICHMOND FOUR	1	1	3	1	4	0	0	1	1	2	1	1	16
MOORE DRYDOCK	3	4	4	5	4	4	1	2	3	3	1	3	37
WESTERN PIPE	1	1	0	0	2	1	2	0	1	1	1	2	12
BETH-ALAMEDA	0	0	0	0	0	0	0	1	1	0	1	1	4
CONSOLIDATED	9	3	9	4	3	1	1	4	4	4	6	6	54
CALSHIP	11	11	6	6	7	7	7	6	5	4	6	8	84
CONCRETE	3	1	4	3	5	6	4	2	1	1	1	0	31
BARRETT-HILP	0	0	1	1	1	3	1	3	2	1	0	0	13
TOTAL	67	58	73	64	72	55	38	32	46	51	61	55	672
D.W. TONNAGE	649,996	590,992	678,719	642,875	692,639	517,908	398,269	296,249	390,072	371,790	453,602	530,027	6,213,138

*Does not include tugs (steel and wood) and barges (wooden) output.
Deliveries and deadweight tonnage are considerably below 1943 due to the completion of Liberty Vessels on West Coast in July and the numerous vessels constructed for U. S. Navy.

powered with two Skinner Uniflow steam reciprocating engines and having a designed speed of better than 20 knots. These Sea Raiders carry 35 planes, and their maneuverability makes them invaluable for convoy duty.

The S2-S2-AQ1 Frigate is a vessel of 303′ 11″ overall, 37′ beam, powered with twin screw propellers, develops 5500 hp, and can cut through the water up to 20 knots.

The next vessel worthy of special mention is the largest vessel ever constructed on the Pacific Coast, the P2-SE2-R1, a vessel designed as a combination passenger and cargo vessel. It is 608′ 11″ overall length, 75′ 6″ beam, lightship displacement 12,043 tons, loaded ship displacement 22,573 tons, deadweight 10,530 tons. This vessel is powered with two 8500 turbo-electric-driven motors and has a designed speed of better than 18 knots.

The last vessel worthy of special mention at this time is the Victory ship. This vessel is now being constructed in the yards formerly allocated to the Liberty vessels, and was designed for production methods very similar to those used on the EC2's.

The Victory ship, while designed for mass production, is a far cry from the Liberty vessel, and was designed for post-war trade. This vessel is 455′ 3″ overall, 62′ beam (maximum), 28′ draft, with cruiser type stern and straight stem and powered with standard type speed cross-compounded double reduction geared turbine of the latest marine type.

The record for the Pacific Coast for the year 1944 writes another page of achievements in the records. While the number of ships and deadweight tonnage are not as great as the year of 1943, the types of vessels were of much greater value to the Navy as combat vessels, troopships and auxiliaries, and required much higher type of construction.

VESSELS CONSTRUCTED UNDER U. S. MARITIME COMMISSION

CALIFORNIA, PACIFIC COAST, AND NATION 1940-1944

Year	Area	Vessels Delivered	D.W.T.
1940	California	1	12,300
	Pacific Coast	1	12,300
	United States	55	641,100
1941	California	21	221,500
	Pacific Coast	27	265,500
	United States	134	1,432,300
1942	California	245	2,621,300
	Pacific Coast	371	3,925,200
	United States	746	8,089,700
1943	California	650	6,413,300
	Pacific Coast	956	9,494,100
	United States	1949	19,323,600
1944	California	489	4,320,600
	Pacific Coast	705	6,326,600
	United States	1777	16,310,500
Grand Total	California	1406	*13,589,000
	Pacific Coast	2060	**20,023,700
	United States	4661	45,797,200

*California delivered 29.5% of United States total.
**Pacific Coast delivered 43.2% of United States total.

A "C" type ship.



Naval Architects and Marine Engineers



W. S. Newell, president-elect of the Society.

At the 52nd annual meeting of the Society of Naval Architects and Marine Engineers, John F. Metten, who has served as president for the past two years, handed the gavel to W. S. Newell, president elect. Both of these men are shipyard executives, Mr. Metten being chairman of the board of the New York Shipbuilding Corporation, Camden, N. J., and Mr. Newell president of the Bath Iron Works Corporation, Bath, Maine. Between them in training and experience they represent the full scope of the activities of the Society, Mr. Metten on the marine engineering side, Mr. Newell on the naval architectural side.

As president, Mr. Newell brings a very rich cultural and professional experience to bear on the problems of the Society. Born in Albany, New York, on May 31, 1878, he was graduated from the Massachusetts Institute of Technology in 1899 and was later employed at the Maryland Steel Company, Sparrows Point, Md. He was a ship's draftsman at the Bath Iron Works, Bath, Maine, from 1900 to 1907; was assistant to the vice president and superintending engineer from 1907 to 1914; engineering works manager of the same company from 1914 to 1925.

Mr. Newell was general manager of the New York Shipbuilding Corportation from 1925 to 1926; president of the Bath Iron Works Corporation since 1927; president of the Bath Water District from 1915 to 1940; president of the Bath Savings Institution from 1933 to 1941; president of the South Portland Shipbuilding Corporation from 1941 to 1943; president of the Kennebec Towage Company in 1934; president of Todd-Bath Iron Shipbuilding Corporation; president of Eastern Maine Towage Company; and president of the United Seamen's Service, Inc. He is director of the Maine-Central Railroad; the Bath Trust Company; Bath Savings Institution; Union Mutual Life Insurance Company; Mack Trucks, Inc.; Shipbuilders Council of America; and the Port of Portland Authority. He is a life member of the Corporation of the Massachusetts Institute of Technology; a Trustee of Colby College; and a Trustee of the Webb Institute of Naval Architecture.

He is a member of the Institution of Naval Architects of Great Britain; the North East Coast Institution of Engineers and Shipbuilders; the American Society of Naval Engineers; the American Committee of Lloyd's Register of Shipping; the American Bureau of Shipping; New York Chamber of Commerce; Boston Chamber of Commerce; New England Council; and is chairman of the Maine Committee, American Branch, Newcomen Society of England.

Mr. Newell has received the degree of Bachelor of Science from the Massachusetts Institute of Technology; Master of Science from Bowdoin College; Doctor of Laws, Colby College; and Doctor of Engineering, University of Maine. He is a member of the Cumberland Club and Portland Club of Portland, Maine; University Club of Boston, Mass.; The Engineers Club; University Club and India House of New York.

California Section Honored

Among those newly elected to the Council of the Society is George K. Nichols, vice president in charge of engineering, Matson Navigation Company, San Francisco, and chairman of the newly-formed Northern California Section of the S. N. A. M. E. It is an interesting coincidence that Mr. Nichols was born in Bath, Maine, and received his education in that city. On the completion of his apprenticeship in marine engineering with the Bath Iron Works Corporation he moved to the Newport News Shipbuilding and Dry Dock Co. at

Newport News, Va., where he remained for four years.

During the next twelve and a half years he was in charge of the design of all machinery arrangements and piping in the Fore River yard at Quincy, Mass.

The U. S. Emergency Fleet Corporation then placed him in Philadelphia in charge of their supervision at the Hog Island and Bristol shipyards; he was later appointed district manager in charge of all shipbuilding and repairs in the Philadelphia district. He was then transferred to Washington, D. C., as repair department representative of the Emergency Fleet Corporation, eventually becoming vice president of that organization.

On January 1, 1927, the Matson Navigation Company of San Francisco called him to the Coast to organize and manage their repair department in San Francisco. His staff in this department originally amounted to 100; at the peak of the war emergency repair and conversion program the total number of employees was about 4500. He was made a vice president of the company on June 18, 1944.

He has always taken an active part in S.N.A.M.E. affairs.





George K. Nichols, elected member of Council.

Naval Architects Hold Tonnage Rules Handicap to Ship Design

Scoring the confusing and contradictory tonnage regulations as a serious handicap to international shipping, Mr. Metten, in his annual address, announced that the Society has appointed a Committee to make a study of the regulations and laws controlling tonnage measurements with



Left: J. H. King, manager Marine Department, Babcock & Wilcox Company, and secretary-treasurer of the Society.

Right: William S. Newell (right), newly-elected president of the Society, receives the congratulations of John F. Metten, retiring president, who completed his two-year term of office at the conclusion of the 52nd annual meeting.



Top: John E. Slater, associate Council member, presenting his paper before the Technical Session on November 17. It was entitled "Economic Considerations in the Design of Future Combination Passenger and Cargo Ships."

Center: Vice Admiral Emory S. Land introducing Rear Admiral Edward L. Cochrane, U.S.N., who was the principal speaker at the annual dinner of the Society.

Bottom, left to right: Admiral William D. Leahy, U.S.N.; John F. Metten; Vice Admiral Emory S. Land, U.S.N. (ret.).





the object of removing the handicaps on ship design imposed by present rules.

"The existing laws consist of a patchwork, overlaid from time to time, on laws that go back to early maritime history," stated Mr. Metten. "They are supposed to represent the measurement of the earning capacity of a ship upon which port dues, canal tolls, etc., are based. Actually, they consist of confusing and contradictory regulations, and the result is that in many trades, such, for example, as involve voyages passing through the Suez or Panama Canals, abnormalities in design are required to offset penalties from abnormalities in the law.

"This situation with respect to tonnage regulations is paralleled by our United States laws regulating all factors involved in merchant shipbuilding. These come under the purview of perhaps a dozen more or less unrelated administrative branches of our Government which are poorly coordinated, and result in endless confusion.

"A great service to American shipbuilding and ship operation would result if all Government activities regulating sanitation, documentation, health provisions, safety provisions, hull and machinery inspection, etc., were placed under a single administrative branch of the Government. This should be staffed with non-political employees, selected for their knowledge and experience in the marine field. The present cumbersome and inefficient system constitutes a handicap to the American merchant marine. It would also help the Navy building yards if the Navy undertook a program of simplification in various directions such as specifications and inspection procedure, etc. The growth processes of red tape are very similar to the joint-by-joint growth of tapeworms, and have the same effect upon the victim."

Technical Papers

The technical sessions were well attended and the papers were of great interst. In the December issue we printed brief abstracts of most of these papers. Those not appearing in that issue follow herewith.

On the Turning and Steering of Ships

by Kenneth S. M. Davidson

The author of this paper is direc- or of the towing tank at Stevens nstitute of Technology, Hoboken. e describes the paper as "essen- ally a progress report on methods attack, dealing first with broad ncepts in an attempt to gain per- pective on the scope of the problems volved and second with analytical d experimental procedures aimed simplifying a comprehensive at- ck.

"Attention is centered largely on e influence of the hull. In effect e point of view is adopted that better knowledge of hull action is a rerequisite to a better understand- g of rudder action and, ultimately, f interference effects between hull, udder and propellers.

"It is an old adage that a good rning ship is hard to steer and a ood steering ship is hard to turn. urning is the process of altering ourse. Steering is the process of rrecting course.

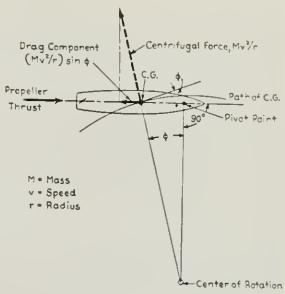
"In the overall picture, the func- on of the rudder is to adjust the rientation of the hull to the flow, ist as the function of the elevators f an airplane is to adjust the angle f attack of the wing. Thus it is atural and proper, in dealing with e hull, to consider the rudder rgely in terms of the forces and oments produced, or needed to ef- ect a given result. Direct measure- ent of the lateral rudder-force com- onent does just this, and, with the adily calculated centrifugal force, rovides the necessary information r exact determination of the hull rce in steady turning.

"The two models for which analy- es are given in detail are not espe- ially significant in themselves. They ere selected largely because, with enerally similar types of hulls, they ad quite different displacement- ength ratios and had been found o have very different turning char- cteristics. The analyses show the ulls to differ considerably in re- pect to hull-force coefficients and enters of pressure, both in steady- urning and in straight-line motion, nd suggest two generalizations:

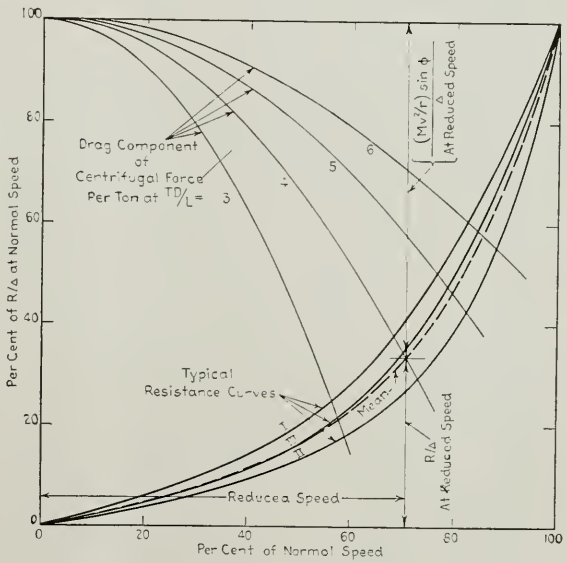
"(1) That, under corresponding onditions, the force coefficient in- reases and its center moves forward with increase of beam (decrease of length-beam ratio),

"(2) That the shift of the center which accompanies a change of diameter-length ratio, or a change from straight-line to steady-turning motion, is independent of design differences.

"To be sure, these are as yet nothing more than indications—guide-posts for directing further experiments on a systematic basis. They



Drag Component of Centrifugal Force in Steady Turning



Method of Computing Speed Reduction in Turning; Used for Mean Curve for Fig. 3

Typical curves of straight-course hull resistance and drag component of centrifugal force Resistance curves are for Standard Series hulls, as follows:

Ships	Displacement-Length Ratio	Beam-Draft Ratio	Prismatic Coefficient	Normal Speed-Length Ratio
I	60	2.5	0.60	1.2
II	100	2.5	0.65	1.0
III	170	2.5	0.70	0.8

Drag curves are based on pivot point locations from test data. Drag curves are parabolas' since centrifugal force varies as V^2. If total propeller thrust is assumed to remain constant during turning, and straight-course hull resistances are assumed to apply, then the drag component of centrifugal force reduces the thrust available for forward speed. As an example, a ship having the mean resistance curve indicated has a steady-turning speed 71 per cent of its normal speed, when turning in a steady circle with $TD/L = 4$.

are important at this time primarily because, unless full advantage is taken of indications of this sort which come to light, and reasonable luck is had in selecting for emphasis those indications which bear most directly on the controlling variables, any comprehensive program of systematic experiments becomes too lengthy and involved to be practicable."

Tensile Properties of Welded Plate Specimens Simulating Deck and Shell Joints

by Leon C. Bibber

Welding Engineer, Carnegie-Illinois Steel Corporation

This paper is in a sense a continuation of another paper by the same author read before the same society in 1932. The series of tests described in the first paper was conducted at the Bureau of Standards. In the present series the author is endeavoring to get some light on the reasons for failures in large welded structures such as ships and to add a little to the store of knowledge on the behavior of such structures under strain. Heavy plate welded specimens were tested under various conditions and with many specimens. The author concludes:

"(a) That good strength and elongation can be obtained from longitudinally welded joints of heavy plates in both the angle type and the flat plate type, although considerably less elongation occurs in the tee type when automatically welded with the deck in the horizontal plane.

"(b) That a square type of fracture is practically always obtained from welded joints pulled longitudinally.

"(c) That the occurrence of a sharp square fracture is not an indication of the absence of ductility in the steel.

"(d) That at extreme elongation the welds will crack at intervals to accommodate themselves to the greater ductility of the base metal without preventing further elongation. The Unionmelt welds, while smoother than the hand welds, perform but little better than the latter. Hand welds with the reinforcements ground off may be slightly superior to those with the reinforcements on, but the former crack almost as much as the latter.

"(e) That the tensile properties of the Unionmelt weld metal and heat-affected zones when removed are very similar to those of the unaffected base metal.

"(f) That the presence of small round blowholes in the weld reduces the tensile strength of the welded structure but little, but may cause considerable reduction in its ability to elongate. The latter, however, is not a serious practical fault because the strength and elongation found in the pertinent tests are far in excess of that which could ever be utilized in a ship structure in service.

"(g) That the careless striking of arcs on heavy plate material in cold weather can cause serious local increases in hardness which can readily give rise to cracking and could conceivably be the start of a ship failure.

"(h) That the plate material cut from an actual failed ship still retains almost all of its original ductility.

"(i) That the tee type of joint between the sheer strake and deck stringer should probably not be welded with an automatic process because it is difficult, if not impossible, to make such a weld that does not contain longitudinal cracks.

"(j) That the presence of longitudinal cracks in the weld is definitely undesirable, mainly because at places they may contain branches which could readily become transverse cracks and cause failure of the structure.

"(k) That abrupt changes in section in a structure are points of weakness even under static loading because of stress concentration and inefficient use of part of the metal.

"(l) That even with the short flat welded specimens designed to provide lateral tension, it was not possible to obtain significant increases in strength accompanied by decreases in elongation, although it was possible to produce sharp square fractures in almost all cases.

"(m) That stress relief annealing considerably increased the elongation of both base metal and welded joint specimens.

"(n) That joints which have transverse residual tension through restraint develop less overall strength and considerably less elongation than those which contain primarily residual longitudinal stresses.

"(o) That the performance of the large long tensile specimens compares favorably with the performance of small coupons of the same steel.

"(p) That the notch-bar toughness of thick mild steel plate at —20 degrees F is naturally low.

"(q) That the notch-bar toughness of the weld and welded joint is very similar to that of the base metal."

SUMMARY OF RESULTS ON LONG PLATE SPECIMENS

Type of specimen	Unwelded plates				Longitudinally Welded Joints	
Heat treatment	None (as rolled)		Stress relief annealed		None (as welded)	
End restraint	None				None	
Specimen mark	203-11B	203-12	203-13	203-14	203-15	203-16
Temperature of testing, deg F	85	21	85	20	80	21
Yield point from head-lb	837,000	887,000	914,000	992,000	862,000	903,000
movement curve psi	28,200	29,800	31,100	33,200	29,800	31,200
General cracking of mill lb.	1,300,000		990,000		903,000	
scale (yield point) psi	43,700		33,300		31,200	
Maximum load lb	1,833,000	1,898,000	1,826,000	1,923,000	1,790,000	1,806,000
psi	61,600	63,800	62,300	64,500	61,900	62,400
Elongation between gage In 128 in. per cent	27.344	29.241	24.938	29.807	28.538	11.375
points In 8 inches per cent	21.1	22.8	19.5	23.3	22.3	8.9
in. per cent	4.450	3.530	..	4.126	2.963	
	55.6	44.2	..	51.6	37.1	
Reduction in thickness — Average in reduced section	0.124 in.	0.125 in.	0.106 in.	0.133 in.	0.122 in.	0.053 in.
	10.00%	10.09%	8.65%	10.70%	9.91%	4.29%
Average at fracture	0.290 in.	0.294 in.	0.335 in.	0.254 in.	0.215 in.	0.064 in.
	23.39%	23.73%	27.35%	20.43%	17.48%	5.19%
Maximum at fracture	0.358 in.	0.403 in.	0.450 in.	0.413 in.	0.252 in.	0.073 in.
	28.88%	32.53%	36.75%	33.23%	20.48%	5.92%
Reduction in width — Average in reduced section	2.264 in.	2.278 in.	1.945 in.	2.370 in.	2.127 in.	0.881 in.
	9.47%	9.47%	8.13%	9.88%	9.06%	3.76%
At fracture	5.081 in.	4.161 in.	4.178 in.	4.545 in.	3.482 in.	1.011 in.
	21.20%	17.31%	17.45%	18.95%	14.85%	4.31%
Reduction in area — Average in reduced section	5.569 sq in.	5.543 sq in.	4.718 sq in.	5.821 sq in.	5.223 sq in.	2.283 sq in.
	= 18.75%	= 18.61%	= 16.06%	= 19.53%	= 18.08%	= 7.89%
Average at fracture	11.846 sq in.	10.999 sq in.	11.749 sq in.	10.587 sq in.	8.586 sq in.	2.684 sq in.
	= 49.90%	= 36.93%	= 40.10%	= 35.52%	= 29.73%	= 9.28%
Longitudinal efficiency, per cent	90.9	94.0	99.6	103.1	90.2	90.9
Fracture	Single 45°	Double 45° Single 45° Square	Irregular double cup	Square Single 45° Square	Square Single 45° Double 45° Square	Square

Largest Tanker Approved

When the S. S. Phoenix, world's rgest all - welded tanker, was unched recently at Norfolk, Va., r fitness for sea was backed by 116 ys of rigid scrutiny by officers of he U. S. Coast Guard Merchant Ma- ne Inspection Division.

From keel laying to launching, om bilge to bridge, Coast Guard in- pectors supervised her construction insure structure suitability, as well inclusion of every known contriv- nce for safety of the ship and crew.

Although not the longest, the hoenix is the largest tanker ever onstructed from the standpoint of rgo-carrying capacity. This capac- y—9,000,000 gallons (214,000 bar- ls) will provide a substantial boost delivery of war-vital gasoline to he fighting zones.

The 116 days of construction indi- te the speed which fast-welding has tained. After plans and specifica- ons of the vessel had been approved Coast Guard Headquarters and he keel laid, large prefabricated sec- ons were quickly welded into place. spectors who watched her take hape are members of a nation-wide rce of experts in the Coast Guard Merchant Marine Inspection Divi- on. They made certain that tur- ines, boilers, and shafts were in rime condition, life crafts adequate- equipped and provisioned, and that ecessary fire precautions were ob- rved. One new safety feature is an tomatic releasing device on life fts which allows them to float off he vessel, in case time prohibits unching.

Issued a certificate of inspection fter trial runs proved her seaworthy nd safe, the world's thirstiest tanker oes to sea as an important addition the nation's merchant fleet.







Top of page: The Phoenix shown after completing trial runs. She passed inspection by officers of the U. S. Coast Guard Merchant Marine Inspection Division.

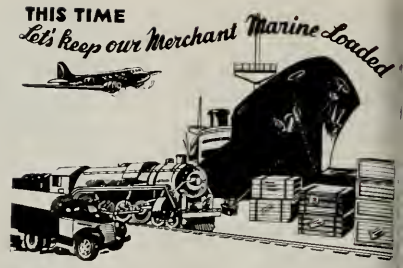
Center: Lieut. Comdr. M. S. Richardson checks the work of a yard workman installing Butterworth plates on the deck of the tanker as she was being constructed.

Bottom: On the trial run, members of the Coast Guard Merchant Marine Inspection Division stood by aboard to watch her performance.

(Photos Official Coast Guard Photos)

Pacific WORLD TRADE

By T. Douglas MacMullen



Pacific Shipping Meshes With World Affairs

By Henry F. Grady



President, American President Lines.

President, S. F. Chamber of Commerce.

Chairman, Federal Reserve Bank of S. F.

Chairman, International Business Conference.

Chairman, Economic Committee, League of Nations.

Trustee, United Seamen's Service.

Director, National Federation American Shipping.

Former Assistant Secretary of State.

Author and Statesman.

It is my desire to carry on the good work of the San Francisco Chamber and to extend San Francisco's horizons and influence even further. We must build the ground floor for the advent of world commerce, world communications, and the interest in world affairs which will follow the war.

The long-term possibilities of Pacific Area trade are great, but realization is contingent on peace, development of political stability, the organization by the countries themselves of programs of reconstruction, and reestablishment of their production, both raw materials and manufactures, on an effective basis, so that they will be able to purchase, either for cash or credit, the equipment and supplies necessary to expand their economy.

It would be a mistake to be over-optimistic on the short-term possibilities of trade, and by the same token we should not be too pessimistic over the long-term possibilities. There have been some discussions among bankers and traders and there will be further discussions. Later there will be taken up with Government officials the subject of the part San Francisco will play in this overseas trade development program.

The purpose for which the recent International Business Conference at Rye, New York, was called—to obtain an interchange of information and viewpoint on the part of the rep-

sentatives from 52 countries in at-
ndance—has been accomplished in
atmosphere of harmony and good-
ill which holds high promise for the
use of private enterprise and inter-
ational trade.

Each delegation takes back to its
vn country a better knowledge and
nderstanding of the basis for the
evelopment and maintenance of
und, constructive international
ommercial relationships among the
ations of the world. In making these
ewpoints known to their people and
eir governments, we feel that a
bstantial contribution can be made
the promotion of economic well-
ing in every land upon the founda-
on of which a just and lasting peace
n most surely be built.

The American Delegation, for its
wn part, intends to make known
ere at home, as occasion offers, the
nclusions it has reached in conse-
uence of the discussions held during
e ten-day period, and the view-
oints for which it stands today.

The Delegation went into the Con-
rence fully conscious of the vital
portance of America's part in the
ost-war world. It is convinced now,
om the consultations that have
ken place among its own members
d from the daily contact it has had
ith the Delegations from abroad,
at this part can be played, in Amer-
a's own enlightened interest, only
the United States dedicates itself
ggressively and wholeheartedly to a
orld system of economic unity in
hich the great opportunities that
e age of power and tools has
rought, can be fully realized.

HIPS AND MEN

A recent widely circulated and
uch praised Harbor Day booklet
ore the title "San Francisco, Harbor
f Ships and Men."

Ships, of course, are well-known
djuncts to any harbor. We love to
ee them come and go, for their mis-
ons in war or peace are important.
The men of shipping seldom appear



WORKING CARGO ON SAN FRANCISCO WATERFRONT
TWO BARGE LIGHTERS AND A REFUELING TANKER ARE ALONGSIDE AN ORIENT-BOUND VESSEL AND A ROUND-THE-WORLD SHIP WHOSE HOME PORT IS SAN FRANCISCO

in a prominent place in public life but go on quietly building the trade by which their cities live.

America has many great men in the shipping business, and the nation has been drawing on them with increasing frequency of late, and this is good; for the sturdy types that have built a tough business are the types that can steer a safe course if given the helm.

Recently Roger D. Lapham, Chairman of the Board, American Hawaiian Steamship Company, was elected Mayor of San Francisco, and is steering the city well. Now, with the advent of Dr. Grady to the Chamber of Commerce presidency, we have the head of a leading round-the-world steamship line and the head of a leading intercoastal line guiding San Francisco's business and governmental courses.

It is an appropriate coincidence that on January 2, a leading expert on world trade should be called to



MANILA'S WORLD-FAMOUS PIER

Pacific World Trade

manage the World Trade Department of the San Francisco Chamber of Commerce. He is Kenneth H. Campbell.

Mr. Campbell goes to the San Francisco Chamber post from the National Foreign Trade Council, New York, where he was Trade Advisor. After training and teaching in New York University's School of Commerce he served with the National Association of Credit Men's foreign credit interchange bureau, with the Board of Economic Warfare as Trade Relations Advisor, and finally as Trade Advisor and Secretary of the National Foreign Trade Council's Foreign Trade Reconstruction Committee.

RYE CONFERENCE

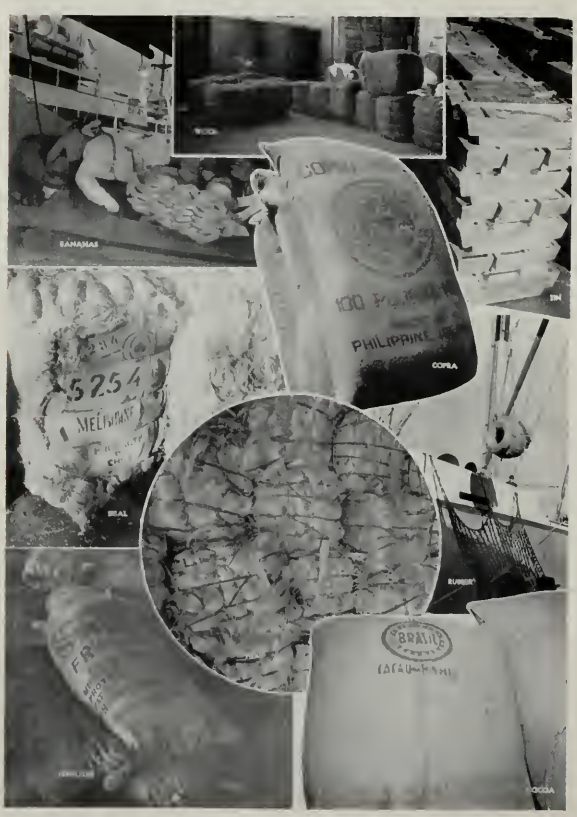
The International Business Conference at Rye, New York, which Dr. Grady headed, will be dealt with at some length in our next issue. Such subjects as cartels, industrialization, currencies, private enterprise, protection of investments, transportation, communications, and foodstuffs were considered.

An interesting aside: Winthrop W. Aldrich of the American Delegation, who wrote the leading article in a recent issue of Pacific World Trade, has since been elected president of the International Chamber of Commerce.



Mayor Roger D. Lapham of San Francisco.

Imports from all over the world.



Kenneth H. Campbell, newly appointed manager, World Trade Department, San Francisco Chamber of Commerce.



Pacific WORLD TRADE

Colombia

Land of El Dorado—Gibraltar of Spanish Main—Gateway to South America



In a global war, Colombia, facing th oceans, is in a strategic position, actically straddling the Panama anal. This position, this proximity the Isthmus, has largely influenced olombian history, and will no doubt ntinue to do so.

Although named for Columbus, he ver landed there; the naming of the untry after the explorer was an terthought—long after. Originally e name was New Granada.

Colombia has been the gateway to very large part of South America id has handled through its ports a ry large part of the trade with the panish colonies of the Southern emisphere. A present-day map of olombia does not tell the whole ory. Originally there was very uch more to the country than there today. Venezuela was included, nd so was Ecuador, and even more nportant from the standpoint of ipping, the Isthmus of Panama.

Napoleon was responsible for the evelopment of Colombia as a nation, or when he invaded Spain and put is brother Joseph on the Spanish hrone, in 1808, many unrelated cities South America threatened separa- on from Spain, and in 1811 Carta- ena declared its independence. Other ties followed suit, but they could ot decide upon a unified system of overnment. It was at this time that lew Granada was set up, which was sort of federation of certain prov- nces, and in 1814 Simon Bolivar, 'enezuelan liberator, was asked to ring the rest of the surrounding de- artments into the movement. Boli- ar's forces, however, were not rong enough to fight off the army that Spain sent against them, and by 1816 New Granada was once more under the Spanish flag, with Bolivar fleeing to Jamaica. After his later successes in Venezuela, Bolivar was back in Bogota in 1819, while his Congress in Angostura, Venezuela, proclaimed the Republic of Gran Colombia, including Venezuela, Colombia and Ecuador, with Bolivar as its head. By 1830 both Venezuela and Ecuador had broken away from Gran Colombia. The Republic of New Granada was set up in 1831, changed its name in 1863 to United States of Colombia and later to Republic of Colombia. That this only high lights the developments from 1821 to 1899 will be noted when it is shown that there were 70 civil wars during that



Dr. Carlos E. Ardila, Consul General of Colombia at San Francisco.



HOW THE AIRPLANE HELPS COLOMBIA

(Time distance, Barranquilla-Bogotá)



Pacific WORLD TRADE

period. In 1903 Colombia refused to ratify the Panama Canal deal with the United States, whereupon Panama declared her independence, and the bitterness that followed between the United States and Colombia was only partly assuaged when, in 1914, the United States agreed to pay an indemnity of $25,000,000 to Colombia and granted certain canal privileges.

Trade

The Canal payments, together with some $246,000,000 of American capital invested in Colombia between 1904 and 1930, have been used to build highways and railroads, for transportation is Colombia's key problem. The advent of commercial aviation was a splendid development for the republic, whose geography, beautiful with almost incredible contrasts, has hemmed the bulk of her people away from each other. The capital, Bogota, and many other big cities are on table-lands 5000 to 9000 feet above sea level, where the climate is cool although the Equator transects the country.

Railroads and highways have presented stupendous engineering difficulties, and were for the most part limited to serving not the ports but the Magdalena River, which was the main artery of commerce. Even now, freight which does not travel by air must be loaded and unloaded sometimes as many as 11 times between Barranquilla and Bogota, and coffee from remote plantations often has to travel on mule back for weeks before it can start this complicated journey toward the sea.

But trade between Colombia and the United States is considerable, and is likely to increase greatly. In normal times there are four major export items from Colombia to the United States and five major items of import. Forty-five per cent of Colombia's export is coffee; 25 per cent is gold; 25 per cent is petroleum, while bananas make up most of the remaining five per cent. Included in the latter item will be found a substantial valuation in emeralds, of which Colombia is the



Simon Bolivar, the George Washington of South America.

world's chief source, and some platinum, of which Colombia is the world's third largest producer.

Colombia's imports from the United States, while covering a wide range of consumer goods and industrial equipment, are mainly centered in five items. They are raw cotton, of which Colombia takes 41 per cent of all that goes to the American Republics; sugar, of which Colombia takes 30 per cent; machinery, 20 per cent; cigarettes, 20 per cent; and chemicals, five per cent.

That some of the above commodities run into very large figures and are well worth the attention of importers and exporters is indicated by a survey recently conducted by the Coordinator of Inter-American Affairs. It shows that Latin America during the next ten years offers a potential market for $10,000,000,000 worth of new and used machinery for industrial expansion. Figures are shown for all countries, and Colombia is number five on the list of 20, following Brazil, Mexico, Argentina and Chile. The figure for Colombia is $586,000,000.

Coffee

Colombia is best known for its coffee, which is indeed its greatest export commodity. The Colombian coffee is sweet, and is used for blending with Brazilian coffee, which is somewhat bitter. While the coffee tree or shrub is a tropical plant, it thrive best and produces the finest frui when grown at the high altitudes Climate, temperature, soil, and espe cially altitude, have a direct influenc upon the kind of beverage produce by the coffees from the different cof fee-growing countries, all of whicl are within the Torrid Zone. Thi finest coffees, those of the riches flavors, are grown in the higher alti tudes. Most of the plantations i Colombia are found at altitudes vary ing from 4500 to 6500 feet above se level.

In order to improve the quality o their coffees, Colombian planter plant other trees between the coffe shrubs. With their lacy, umbrella like bows these shade trees tempe the sunshine and keep the air uni formly moist around the coffee shrub

Colombian planters are for the most part operators of small farms where every tree receives constan care in order that its small yield of to 2 pounds a year may possess the richest body and mellowest flavor. In some countries the coffee tree is al lowed to reach its natural height o 14 to 20 feet, but in Colombia it i kept pruned down to a height of or 7 feet.

The average annual production i Colombia exceeds 4,000,000 bags o 132 pounds each, 75 per cent o which is used in the United States.

Like many other countries, Colom bia has accumulated a very large bal ance of exchange with which t finance its imports from the Unitec States as soon as priorities permit The backlog of industrial and con sumer requirements is already four o five times the total imports of an one pre-war year, and U. S. trader are eyeing the market with interest.

Most industries in Colombia ar privately owned, but the public utili

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Pacific WORLD TRADE

Foreign Trade in Post-War

By Fred L. Doelker
Vice President, Grace Line

Grace Line's plans for post-war ill be a larger fleet to serve its vari- us services.

This means there will be more ips of faster and finer type serving ne countries of Mexico, Central and outh America out of the United tates Pacific Coast, Gulf and East oast than pre-war.

However, to keep ships operating nd maintain good service, increased oreign trade is necessary. If this is o be accomplished and the United tates is to expand its foreign trade oundly and permanently, then for- ign trade should have a larger place n the post-war plans.

Foreign trade is warp and woof of he country's total economic struc- ure, affecting employment and the ational income at home, and is not, s so often regarded by the Govern- ent and even among certain busi- ess groups, as a specialty, a matter part, and only a subject for foreign raders.

If this country is to expand its for- ign trade in post-war and retain its narkets there must be a different ap- roach. Now too few persons are iving any thought to the subject, nd of those who are, many are fail- ng to bring its various elements into roper perspective.

Too often when the average busi- nessman thinks of foreign trade he ocuses his attention on selling of xports, forgetting the fact that im- orts are just as important a part of oreign trade as exports.

In this country it is the rule that he South, and very naturally, looks o foreign trade to marketing cotton; he Western States to agriculture, while the Eastern centers to selling heir manufactured goods.

As Great Britain is doing, a care- ully studied plan wherein American rivate enterprise should accelerate ts activity in the foreign field is im- erative right now.

Unlike after the last war period when our merchant marine was "cast drift" after serving so nobly the war effort, the Maritime Commission s well established, not alone to build



Fred L. Doelker
Vice President Grace Line.
Knight of the Order of Vasa, First Class.

an adequate number of ships but to see that they are constructed along lines to compete with any nation, as well as aiding ship operators in maintaining our peace-time marine services.

Under the able leadership of Vice Admirals Land and Vickery, we have every confidence that never again will this country be caught like it was in 1939. These United States can no longer feel that we are self-sufficient. We must have a merchant marine able to meet promptly and adequately the needs of commerce and defense. Our military leaders will see to the latter after the lesson we have learned as to the pitiable condition of our merchant marine at the outbreak of this war.

This country is a major world power with the largest export trade and second largest import trade among nations. Our people must be educated to the fact that our merchant fleet is part of the national defense, and whether it is to be maintained by parity subsidy or any other name we wish to call it, there can be no return, as existed after the last war, to permit our country's commerce, both exports and imports, to be carried in foreign ships. We have had a pretty close call in this war, we cannot trust to luck a third time. Our prosperity, but more important our security and very existence, demands that the United States merchant marine be second to none in the world.

Government's World Trade Plan

Dean Acheson, assistant Secretary of State, gave the House Subcommittee on Foreign Trade and Shipping the first comprehensive picture from official sources of what this administration proposes by way of international organization and action in the economic field after the war.

Acheson, who is chairman of the interdepartmental executive committee on Postwar Economic Policies, presented nine recommendations and suggestions of possible action and, for the first time, gave Administration policy regarding commodity agreements.

The nine points were:

(1) Repeal of the Johnson Act.

(2) Expansion of the lending authority of the Export-Import Bank.

(3) Ratification by Congress of the International Bank of Reconstruction and Development.

(4) Ratification by Congress of the International Monetary Fund.

(5) Reduction of tariffs.

(6) An international trade conference.

(7) Creation of "an international trade organization."

(8) Possible expansion of the powers of the Securities and Exchange Commission.

(9) Approval of the International Security Organization.

Los Angeles Paces World Trade Field

By Stanley T. Olafson
Manager, World Trade Dept., Los Angeles Chamber of Commerce

Emergence of the Los Angeles region from the war as an important world trading center is foreseen by an increasing number of Government authorities and businessmen from all parts of the United States. Belief in this new era of international commerce is so strong that post-war planning in the field of foreign trade has been carried on in rapidly broadening programs ever since late 1943, with the result that many Eastern trading companies already have established branch organizations in Los Angeles.

When war emergencies pushed industrialization of the Los Angeles area 20 years ahead of the trend of normal growth, the Los Angeles Chamber of Commerce realized that opportunities to expand world trade likewise had been multiplied at a much greater than normal rate. Although most of the new trading opportunities will have to wait until the war is ended, the Chamber of Commerce foresaw that a great deal of preparation had to be made before Los Angeles could meet these new economic responsibilities.

The first action taken by the Chamber's world trade department was the organization of a World Trade Clinic, in which practical importers and exporters could educate Los Angeles businessmen in the techniques of foreign trade. The clinic started functioning late in 1943 and has just ended three series of studies in 33 meetings. At these sessions, some 100 experts laid before the business community down-to-earth procedures for successful importing and exporting, for the institution of sound methods of buying and selling in Latin America, and for developing commerce between Southern California and various units of the British Empire.

Further clinic studies will be launched in the future on the outlook for trade with the Far East and the European countries.

Meanwhile, it was realized that in addition to technical considerations of actual importing and exporting operations, businessmen in this new era would have to be kept in constant touch with broad international political, economic and social trends. The growing intervention of government in economic life was making it imperative that traders be familiar with world forces directly and indirectly affecting their opportunities to carry on business.

To meet this challenge, the Chamber of Commerce World Trade Department set up an educational forum unique in American economic history. In May of 1944 the Southern California World Trade Institute was organized, with a schedule of monthly meetings for the study of problems created by changing world economics. Economists, various university authorities and high Government officials have been brought in to lead the discussions.

To date businessmen have probed the economic policies of the United States and their relation to international commerce, United States tariff policy, national planning versus international trade, cartels and business combinations and their effects on California industries, and the international monetary stabilization fund



and the world bank for reconstruction proposed at the Bretton Woods conference of United Nations.

So successful has been this type of educational work that beginning in January, 1945, the World Trade Institute will hold two sessions monthly instead of one.

Accompanying these broad and technical studies, the Chamber of Commerce is working closely with carrier systems, in order to assure merchant marine and shipping operations and air transport fully adequate to meet increasing transportation needs. In this connection, the harbor departments of both Long Beach and Los Angeles have placed themselves in excellent financial condition and are currently engaged in long-range planning for the post-war period. Promises have been made that all facilities required to handle the expected increase of tonnage in world commerce will be installed as soon as practicable.

The work of the Chamber of Commerce in promoting world commerce is winning wider recognition daily. Foreign businessmen and governments alike are coming to the Chamber's world trade department in increasing numbers every week, all seeking economic surveys of the Los Angeles region, analyses of industrial production and opportunities to build trade with other nations. There is a rapidly growing list of businessmen from other countries who seek to become agents for manufacturers of this area in foreign distribution of products.

Many foreign governments have requested both broad studies of the Los Angeles economic region and specific surveys to determine what products will be available here for sale abroad after the war. Requests of this type are mounting daily.

These special post-war planning projects of the Chamber are in addition to a long list of services rendered as part of routine functions of the world trade department. This everyday work includes:

(1) Location and expansion of export markets for Los Angeles County products.

(2) Location of foreign sources of raw materials and goods needed by manufacturers here.

(3) Publicizing of the resources of Los Angeles County and locally-manufactured products throughout the world.

(4) Maintenance of contacts with buyers, importers and distributors in open world markets for the benefit of Los Angeles County businessmen.

(5) Operation of a branch office in Mexico City, with plans laid for opening of other branches in all principal marketing areas of Latin America.

(6) Provision of counsel to individual firms to aid them in determining the best manner in which they can participate in world trade.

(7) Compilation of a world trade index of local and foreign trading organizations.

(8) Dissemination of inquiries from foreign businessmen to Los Angeles firms.

(9) Interpretation of current foreign trade controls and regulations both of this and other countries.

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Paraffine—a World-Wide Enterprise

In keeping with America's plans or a new era of international trade fter the war, The Paraffine Com anies, Inc., San Francisco, announce he formation of a Division of Over eas Trade.

"This new Overseas Trade Divi ion replaces and greatly expands the cope of our former Export Divi ion," states R. R. Marsh, manager of his new Division in this large West rn industrial, speaking from the ompany's headquarters in San Fran isco.

"America is learning that interna ional prosperity depends upon two way traffic in trade," he explains. "In re-war times, due to rising tariff valls and other restrictions with which many countries surrounded hemselves, foreign trade was apt to e a one-way affair—practically all xport, with the minimum of import.

"Where our old Export Division oncentrated its entire effort for over 0 years upon promoting the sale of Pabco products in foreign lands both those manufactured in U. S. A. nd in our Australia and New Zea and factories), our Overseas Trade Division will not only continue this ctivity, but also seek in foreign lands or raw materials that can be shipped o the United States and processed nto finished products for domestic ale as well as importing finished roducts for sale in domestic markets.

"There is no question that the ost-war overseas market for Amer can products such as those manu factured by Pabco will far exceed re-war totals, providing the over eas countries have the dollars to ay for the goods they need—and his will call for two-way trading," Mr. Marsh emphasizes, with the au hority of a businessman who has pent the greater part of 29 years elping to open up overseas markets or Pabco products such as paint,



R. R. Marsh
Manager, Overseas Division,
The Paraffine Companies.

roofing, shingles, linoleum and other types of hard surface floor coverings. Coming direct to San Francisco from Australia, where he served as the

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Managing Director of Pabco Products Pty. Limited, he has studied at first-hand the needs and opportunities of the East Pacific Basin in the Dutch East Indies, Straits Settlements,

Strategically-located to serve world markets.



China, and the Philippines, as well as the countries "down under."

When he returned from Australia he brought with him numerous samples of raw materials not produced in this country. "In the Far East and the Antipodes," he says, "there are many raw elements that can be adapted to the manufacture not only of Pabco products but also of many other products of American industry. Likewise, in South Africa, India and South America there are many untapped sources of raw materials for America to process into finished products. The more we buy from these lands the more we help to assure not only their stability and prosperity, but also own own, because any rise in income in these countries is bound to be reflected immediately for the products that America manufactures and exports."

Mr. Marsh also brought with him many samples and exhibits of finished products made in foreign countries that are being considered for marketing in this country.

Asked about the war work of Pabco Products Pty. Limited, overseas factories in New Zealand and Australia, he declared that their entire resources and facilities are wrapped up in the production of material for victory. "Our company's experience in manufacturing special war goods and in the production of our regular lines of products for the armed forces will help immeasurably in creating the products of the post-war era," he points out.

"For instance, let us consider one of these products. It's called 'Pabcotite.' It's a hessian-base fabric, manufactured in our Australian factory, and is used as a covering for military air fields to keep off the rain. It is also used to protect exposed cargoes from tropical storms, moisture and

Early-day paint shop in San Francisco, specializing in Paraffine products.



Diversity? Yes, here's one of the 2000 or more Pabco items . . . mulch paper to protect pineapple and other plants from insects and to hold moisture.









Industries have
pended upon Pe
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aid in problems re
ing from floors
kill bacteria to wr
pings that prot
pipelines from co
sion.

mildew. Moreover, Pabcotite makes an excellent portable roof covering, and is frequently strung over the roofs of temporary shelters to safeguard the men from the elements.

"This is just one of thousands of new products being developed abroad. Couple this with the fact that American industry is only waiting for peace to spill the greatest cornucopia of new and better products—and you have the base for the rising standard of living throughout the World of Tomorrow. Thousands of young Americans have always dreamed of forging careers for themselves in promoting Foreign Trade. Many of them tried and failed during the Isolationist Twenties and Thirties when nations shut themselves off one from the other, even when they sadly needed materials and products they could by no stretch of the imagination produce at home for themselves. But now, in the International Forties and Fifties just ahead, thousands of American men returning home from the wars will find that their places in the sun can be won by helping to stimulate international trade.

"For more than half a century The Paraffine Companies, Inc., has been intimately associated with trade overseas; and the management of our organization is one in believing and preparing for this great opportunity just ahead."

Products and trademarks of The Paraffine Companies are familiar to the peoples of many lands.



The Marine Underwriter A World Trade Partne

By F. B. Galbreath

Manager, Marine Office of America, San Francisca

The American marine insurance companies, while busily engaged in handling problems created by these war years, are none the less aware of their responsibilities in the expected post-war up-surge of foreign trade. The marine insurance companies in the United States are literally the protectors of the financial investments of American shippers and shipowners. Every merchant and importer or exporter who is interested in transporting goods to or from the United States by the sea routes of the world is likewise interested through marine insurance in protecting the venture from loss by damage during the period of transportation.

The American manufacturer who yesterday never directly concerned himself with foreign markets will find after the war that foreign markets will offer new opportunities. The American marine insurance underwriter will make possible these new ventures by the financial protection of their policies.

The prompt adjustment and payment of claims in ports throughout the world is an important factor in the development of foreign trade. In Europe, in the Orient, in the Indies, the end of the war will bring problems in the reestablishment of proper claims services. But underwriters are well aware of this and even now are planning the post-war steps for adequate claims service in the war-affected areas.

The new fields of foreign commerce to be opened by post-war aviation offer marine underwriters further opportunities to help develop American foreign trade. It may well be expected that a large percentag of airborne articles will be of a va uable nature. This will mean th owner of such merchandise will nee financial protection against loss o damage. World trade will be carrie on in airlines of many nations—per haps with no standard or commo principles of carriers liability for los or damage. But the marine under writer will be able to protect the ven ture with insurance protecting th shipper who might otherwise fac heavy financial loss. Currently, for eign airline bills of lading exclud damage from "Acts of God," but th marine underwriter, prepared t grant a full form of coverage to ai shippers and with a world-wid claims service, will give the financia security needed in the opening of th new world-wide air trade routes.

There is no question but that th end of the war will find underwriter in America ready to do their part i the establishment of American for eign trade. This will be through be ing prepared to give the America shipowner and the American airlin owner the insurance protection they will need on the new sea and ai fleets, and to give the importer an exporter the insurance security need ed on the goods to fill them.

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Import Financing by Letter of Credit

By A. M. Strong

Vice President and Manager Foreign Department, The Public National Bank and Trust Company of New York.

The use of the Banker's Letter of Credit for the financing of imports began on a wide scale in this country only about 30 years ago. Prior to the last war, Letters of Credit were little known and were issued in foreign currency, most frequently in Sterling. Since the last war, the Dollar Credit established by American banks has played a steadily increasing part in international trade. It is now accepted all over the world, and it may be expected that this versatile instrument will be extensively used after this war.

Payment by Letter of Credit is an arrangement advantageous to all concerned. It enables the seller to obtain funds as soon as shipment is made, it enables the buyer to obtain credit for the financing of the transaction by the use of the purchased goods as security, and it provides the cheapest method of financing the movement and distribution of commodities.

The establishment of an Import Letter of Credit is the final phase of arrangements between the buyer and the seller. It is preceded by a contract containing details of which the bank is unaware.

The Letter of Credit is an undertaking by a bank to pay or accept drafts accompanied by shipping documents or other documents of title, in accordance with stipulated conditions. It is issued in a variety of forms of three basic types.

The Irrevocable Credit is used when the seller is not satisfied with the buyer's promise to pay and is seeking credit protection. This Credit is a commitment by the opening bank which can be neither modified nor canceled without the agreement of all concerned. It shifts the financial obligation from the buyer to the bank and assures the seller payment for the goods if he lives up to the terms of the Credit.

The Irrevocable Credit contains a definite undertaking to the drawer and subsequent holders expressed by most banks in the following language:

We hereby agree with the endorsers, drawers and bona fide holders of all drafts drawn under and in compliance with the terms of this Credit that such drafts will be duly honored upon presentation and delivery of documents as specified at the drawee bank mentioned herein.

The Confirmed Credit is used when a shipper requires that his local bank make itself responsible for the



A. M. Strong
Vice President and Manager, Foreign Department, The Public National Bank and Trust Co. of New York.

payment in addition to the undertaking by the issuing bank. The advising bank in this case adds its commitment by inserting in the Credit a clause reading approximately as follows:

We confirm the Credit and thereby undertake that all drafts drawn and presented as above specified will be duly honored by us.

The Revocable Credit (Authority to Pay) is an instrument authorizing payment to the beneficiary upon presentation of stipulated documents subject, however, to modification or cancellation without notice. It is infrequently used and serves to finance the transaction during the period of transit. This type of Credit offers no guarantee to the shipper and is issued only when the seller has full confidence in the buyer.

The Revocable Credit contains a clause reading substantially as follows:

This Credit is revocable at will and subject to modification or cancellation at any time without notice to you and does not convey any engagement on our behalf to honor or pay your sight drawing thereunder.

Responsibility of Bank

The obligations assumed by banks in establishing an Import Letter of Credit are defined in the Letter of Credit Agreement. The Letter of Credit affords practically no protection to the buyer as far as quality or quantity of the goods is concerned. Banks do not examine the merchandise—do not know whether the bales, boxes or barrels mentioned in the documents actually contain the merchandise described. No one would expect a bank to employ experts who could verify the quality of chemicals, textiles, minerals, machines, etc., and to weigh or measure the goods shipped. Banks cannot assume responsibilities inconsistent with their functions and with the remuneration they receive.

The bank issuing a Letter of Credit agrees to pay upon presentation of documents, not goods, and since payment is made before the buyer has a chance to examine the merchandise, the transaction must be based upon confidence in the honesty of the seller. Banks assume responsibility only for the documents required by the buyer and will not honor drafts unless the documents are in strict accord with the terms of the Credit. As a rule they limit their liability with regard to the merchandise by inserting in the Letter of Credit Agreement signed by the bank's customer a clause reading approximately as follows:

Neither you (the bank) nor your correspondents shall be responsible for the existence, character, quality, quantity, condition, packing, value or delivery of the property purporting to be represented by the documents, or for any difference in character, quality, condition, or value of the property from that expressed in the documents.

A clear understanding of these principles by the buyer would avoid many controversies that often result in litigation.

Attempts by importers to make banks responsible for the quality of the goods or for the conditions of the primary contract with the seller have not met with success in the courts. The Court of Appeals of New York State held in the case of **Laudisi** v. **American Exchange National Bank** (239 N. Y. 234) that the bank is not obliged to assume the burdens of a

controversy between the buyer and the seller. The opinion of Judge Hiscock contained the following statements:

"The whole process of authorizing banks to issue letters of credit under which the purchase price of the goods is often paid for account of the vendee before he has had a chance to examine them is largely based on confidence in the honesty of the vendor. If the vendee is suspicious of dishonesty, he can guard against it by appropriate clauses in his contract . . .

"The question between the customer and the bank which issues the letter of credit is whether the documents presented with the draft fulfill the specific requirements and if they do, speaking of such facts as exist in this case, the bank has the right to pay the draft no matter what may be the defects in the goods which have been shipped. The bank is not obliged to assume the burdens of a controversy between the vendor and vendee and incur the responsibility of establishing as an excuse for not paying a draft that the vendee's version is the correct one."

A similar view was expressed by Judge McLaughlin in the case of **Maurice O'Meara Company** v. **The National Park Bank of New York** decided by the Court of Appeals (239 N. Y. 386). His opinion reads in part:

"The bank issued to plaintiff's assignor an irrevocable letter of credit, a contract solely between the bank and plaintiff's assignor, in and by which the bank agreed to pay sight drafts to a certain amount on presentation to it of the documents specified in the letter of credit. This contract was in no way involved in or connected with, other than the presentation of the documents, the contract for the purchase and sale of the paper mentioned. That was a contract between buyer and seller, which in no way concerned the bank. The bank's obligation was to pay sight drafts when presented if accompanied by genuine documents specified in the letter of credit. If the paper when delivered did not correspond to what had been purchased, either in weight, kind or quality, then the purchaser had his remedy against the seller for damages. Whether the paper were what the purchaser contracted to purchase did not concern the bank and in no way affected its liability. It was under no obligation to ascertain, either by a personal examination or otherwise, whether the paper conformed to the contract between the buyer and seller. The bank was concerned only in the drafts and the documents accompanying them. This was the extent of its interest."

In a recent decision (October, 1942) in the British Court of Appeal in the case of **J. H. Rayner & Co., Ltd.** v. **Hambros Bank, Ltd.**, Lord Justice MacKinnon stated in his opinion:

" . . . it is quite impossible to suggest that a banker is to be affected with knowledge of the customs and customary terms of every one of the thousands of trades with regard to the dealings in which he may issue letters of credit . . . It would be quite impossible for business to be carried on, and for bankers to be in any way protected in such matters, if it was said that they must be affected by a knowledge of all the particular details of the way in which particular traders carry on their business."[1]

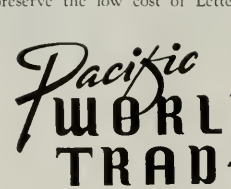
The principle that holders in good faith of drafts drawn under Letters of Credit are not concerned with differences existing between the parties to the primary contract has long been recognized in England and was established by an English Chancery Appeal decision in 1867.[2]

Documentation

Documents customarily required in an Import Letter of Credit are Bills of Lading, Shipper's Invoice, Consular Invoice, and, when the shipper pays the insurance, an Insurance Policy or Certificate. Occasionally other documents are required, such as Weight List, Certificate of Origin, Certificate of Analysis or Quality, etc.

The definitions of documents and interpretation of terms of the Credit are incorporated in the "Uniform Customs and Practice for Commercial Documentary Credits approved by the Seventh Congress of the International Chamber of Commerce" adopted by banks in a number of foreign countries and since October 1, 1938, by banks and other concerns which conduct substantially all the Letter of Credit business in the United States.

Banks examine documents with care and will not honor the draft if the documents do not conform to the terms of the Credit. However, they assume no responsibility for the sufficiency or genuineness of the documents. For practical purposes and to preserve the low cost of Letter of



Credit financing, it would be impossible for banks to keep a record of the authorized signatures and the forms of the numerous transportation and insurance companies or of the issuers of the various documents rendered under Letters of Credit. They are consequently not in a position to vouch for the genuineness of documents. Neither can banks be expected to assume responsibility for the solvency of the transportation and insurance concerns selected by the shipper. Here again the importer must rely upon the honesty and good judgment of the seller, and if he is careless in his choice, he must bear the consequences.

The Letter of Credit Agreement signed by the bank's customer usually contains a limitation clause along the following lines:

Neither you (the bank) nor your correspondents shall be responsible for the validity or genuineness of documents or drafts; or for the character, adequacy, validity, or genuineness of any insurance; for the solvency or responsibility of any insurer; for the solvency of responsibility of any party issuing any documents in connection with the property.

Safeguards for the Bank and the Importer

The remuneration received by the bank for the Letter of Credit justifies only a minimum of risk. The bank must therefore carefully analyze the customer's application for the Letter of Credit and make sure that the conditions are not too involved, that the description of the commodity is not too detailed, and that the documents required are not of an unusual nature.

There has been a tendency among importers to incorporate in Letters of Credit a detailed description of the merchandise in the belief that in this manner they obtain additional protection. This practice, which has become common lately among certain importers and some Government purchasing agencies, should be discouraged and avoided by banks. It affords no protection to the buyer, as his claims must be based upon his contract with the seller, and does not prevent a dishonest seller from shipping worthless or inferior merchandise and rendering documents which conform to the terms of the Credit. The inclusion of details in the Letter of Credit imposes additional unwarranted obligations upon the issuing, advising, and negotiating banks.

Detailed invoices, moreover, frequently contain discrepancies which are as a rule waived by buyers. However, many buyers will not waive even minor discrepancies when the importation is no longer profitable. After the last war, during the period of decline in prices of commodities, there was a widespread insistence upon technicalities to escape from disadvantageous contracts. After this war, during the period of transition and deflation, there will undoubtedly be a similar temptation.

The matter of insurance should be given consideration by the bank. The effectiveness of the insurance is at times the determining factor in the bank's ability to collect on a loss.

What provision should the importer make in the Letter of Credit in order to obtain some protection other than the unsatisfactory remedy of a law suit against the seller when worthless or inferior merchandise is shipped? The bank obviously can assume no responsibility for the quality or quantity of the goods. The importer, however, through proper documentation, can minimize these risks. He can request a Weight Certificate issued by a competent agency. He can appoint a representative to examine the merchandise and can incorporate in the Letter of Credit a request for a Certificate of Analysis

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[1] The Times Law Reports, Vol. lix, London, November 13, 1942.
[2] Financing Foreign Trade, Graham F. Towers, Montreal, 1927.



D. Stewart Iglehart, Chairman (left) and Joseph P. Grace, President, discussing post-war plans. Above, portrait of W. R. Grace, founder of the House of Grace and father of Joseph P. Grace.

(Photo courtesy of Grace Log)

Grace for the Orient

The Clipper Ship W. R. Grace.



Henry S. Parsons, vice president of W. R. Grace & Co., on behalf of Grace Line, recently announced that it has proposed to the U. S. Maritime Commission the establishment of a new post-war Grace Line passenger and freight service from San Francisco and Los Angeles to the Philippines, China and Japan.

The program calls for construction under arrangement with the Maritime Commission of four combination passenger and freight liners of advanced design, which will provide fortnightly sailings from all ports on the route immediately after the advent of peace. The new line is intended to be an important part of the general substitution of American for Japanese shipping, which during three decades prior to Pearl Harbor had been gaining ascendency on the transpacific trade routes from the United States.

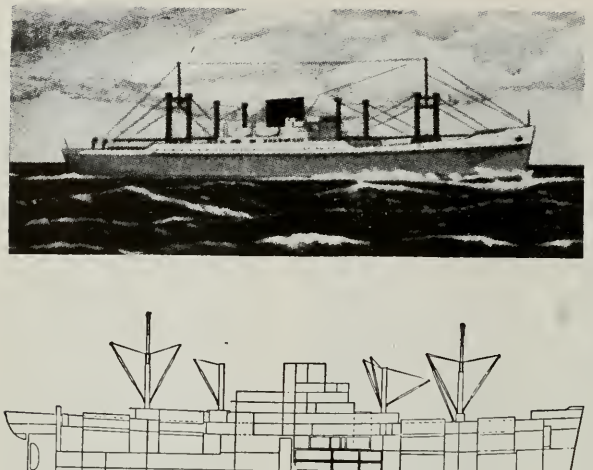
"We are confident that American trade with the Orient will be greatly enlarged after the war and desire to lend our experience and effort in shipping to the restoration of prosperity and progress in the Philippines and China," said Mr. Parsons.

"Not only the natural products but the manufactures of the Pacific Coast should find a greater outlet in the Far East after the war when liberal trade relations are established and Chinese development is no longer overshadowed by Japan's political and commercial aggression. Rapid, frequent, regular and reliable American steamship service will foster a mutually beneficial two-way trade.

"There is need for a much greater American merchant fleet in the Pacific than ever before, since it would be dangerous to American security and world peace to permit restoration of Japan's overseas merchant shipping. We fully share the views of Vice Admiral Land, Chairman of the Maritime Commission, that Germany and Japan, having used their merchant navies as instruments of political and military aggression, should not be permitted to resume their former position on the high seas.

"We propose, subject to Maritime Commission approval, to build four vessels with hulls and propulsion of the famous C-3 type, with commodious and tasteful air-conditioned accommodations for upward of 50 first-class passengers, with swimming pool and other conveniences for passenger comfort and pleasure. The cargo capacity will be approximately 12,000 tons and the speed of the vessels 17 knots or more.

"We are hopeful that reasonably full cargoes, intensive management and freedom from discriminatory practices in the countries served will make an operating subsidy unnecessary, and we have told the Maritime



C-3 cargo and passenger ship built by Sun Shipbuilding and Dry Dock Co. and designed for South American trade.

Commission that we will inaugurate the service without such subsidy.

"This plan marks a return rather than a new entry by Grace in the transpacific trade, as we had a large ownership and management interest in the old Pacific Mail Steamship Company during and after World War I. A number of former Pacific Mail officials and staff are still in the employ of the Grace Line so that the proposed service will have immediately available men experienced in the transpacific trade."

Export Credit Inquiry

Ten thousand exporters in all parts of the country are being asked to report on foreign credit terms in a joint survey undertaken by the Bankers' Association for Foreign Trade and the Foreign Credit Interchange Bureau of the National Association of Credit Men.

The survey is designed to provide those in foreign trade with a "credit yardstick" for any given commodity in all world markets, review the exporters' credit terms extended before the war and present credit accommodations accorded to all existing for-

eign markets, and provide information on financing post-war exports as well as credit and foreign exchange insurance on such business.

Efforts are being made to have major results of the survey ready for presentation at a conference on international credit and finance which is soon to be held by the Foreign Credit Interchange Bureau in New York.

Philip McGovern, assistant vice president of the Manufacturers Trust Company of New York, made a most interesting report to the recent Conference on International Credit and Finance in New York, which gives the strongest possible evidence of the confidence that exporters have in their banking connections and the preference they have for private as compared with Government financing.

He reported the results of a survey of credit terms and credit insurance undertaken jointly by the Foreign Credit Interchange Bureau and the Bankers Association for Foreign Trade.

On the basis of replies received thus far, it is apparent that the great majority of exporters believe that commercial banks have satisfactorily taken care of their requirements and feel that Government export financing, credit insurance and foreign exchange insurance are not necessary on normal short-term export transactions, but may be desirable on the exportation of capital goods requiring long-term financing.

British Resuming Brazil Service

The American Brazilian Association, Inc., of New York City, states that sailings from England to Brazil and the River Platte will be inaugurated by British shipping lines.

This service has been suspended since the outbreak of the war.

COLOMBIA

(Continued from page 32)

ties, including railroads, are operated by the Government. So also is the emerald industry, which is a Government monopoly. Axis countries had considerable investment in public utilities before the war, and also had cash in banks. The latter, together with income from other Axis properties, were impounded and used to buy the shares in utilities held by Axis nationals abroad. Thus the Axis nationals themselves will finance the taking over of their properties in Colombia.

Pacific WORLD TRADE

Imports Must Support Exports

They Must Approach an Overall Balance

Digest of address by Charles P. Taft, director of wartime economic affairs, U. S. Department of State, before the Southern California World Trade Institute, held under auspices of the World Trade Department of the Los Angeles Chamber of Commerce, November 15, 1944.

To begin with, I hardly think I need to argue with this group, or with the West Coast in general, about the importance of foreign trade in the economy. I cannot agree with those who think foreign trade is going to take up the entire slack left by the reconversion of business and industry to peacetime operations. It certainly is not going to start off at three times pre-war levels. But it is essential to our prosperity. Ten per cent is only a rough average of the relation of foreign trade to total trade, and many items of importance are far higher. I have noticed some mention paid recently by Westerners to the retention of these great industrial plants that have been set up here in the West for war work. Clearly the export market is as good in security that objective as one in the United States. So we start in agreement that foreign trade is important.

I don't like the emphasis on exports, however, in all our talk about foreign trade. It wasn't exports by themselves that built our foreign trade; it was imports we wanted so much that we went a long way to get them. The search for a short route to the land of spices led to discovery of America and of the Straits of Magellan and of the Isthmus of Panama. It was the search for gold that opened up the West and Alaska. Businessmen went along on all those expeditions, who disposed of exports and it was always a two-way business, sometimes a three- or four-way business, especially out here in the wide Pacific.

What is that spirit we need to get the world back on its feet. Let's spend just much time finding out what these other nations beyond the setting sun are, that we want or would like to be, as we do in figuring out what we want. That goes even for making of things we can export, for they will have a bad time for quite a number of years to come, figuring ways to their customers to pay them. We are a creditor nation now, and other people don't have much in the way of dollars to pay us with. If you want to be a good businessman, and have all the sensation of a philanthropist at the same time, find something in China or Italy or Greece or France or England that you can buy for dollars and import, and make a profit on. If you can buy it in China and sell it in Australia, and get something else there you can import, all the better. But look for things we need in the United States (and it is all the better if we don't have them now), bring them in and let them pay for our exports via the usual exchange mechanisms.

You see, we are faced with the most difficult business problem in the world's history, because other countries of the world are in such a bad way. Their difficulties are quite different from each other, too, and I want to take three of them to illustrate what we are up against.

France was a country of agriculture and small and big business and industry. It was captured when it was increasing its industrialization, and then its whole production was redirected and geared to the German war economy. Then came liberation with the destruction of all rail bridges in the most important industrial areas, a loss of locomotives and cars, and a breakdown of most communications. In addition every decent port but one was destroyed or held by German remnant forces, and what trucks were available had to carry military supplies and the bare essentials of civilian life. With no raw materials and not nearly enough coal where it could be used, many workers were unemployed and things could be worse even than under the Germans so far as the operation of normal business and exchange was concerned. But that will be solved soon.



Charles P. Taft
Director of Wartime Economic Affairs, U. S. Department of State.

Raw materials will come to the ports, the ports will be opened, the railroads will begin to go, and the wheels of industry and commerce will begin to turn.

But then comes the main problem. With tremendous reconstruction ahead, exports have to be limited until supplies are built up for domestic consumption and for rebuilding the wounded nation. Yet some necessities have to be imported like coal, and they have to be paid for. France has gold, but only so much. So she has to ration domestic consumption to permit reconstruction, and ration exports for both reasons. Exchange has to be rationed to be sure she gets the necessities of life. The necessities from outside cost more exchange than the exports bring in, so that the chances of our selling anything to France but necessities is pretty slim for a while. Slim unless you find ways to help the French to make and sell us things we want and are willing to pay for.

A few months ago I asked a Belgian how long it took them after the last war to get their exports up to the point where they took care of what they had to import. He told me they never reached that point. I asked what particular items which had made the balance before 1914

Pacific World Trade

were less or missing in 1929. He said it was the income from foreign investments. France is likely to be in the same fix, and the best thing our foreign traders can do is to find things in France we can use or sell some place else where there is something we want.

Incidentally, one of the easiest ways to help these foreign countries is to visit them on vacation. I don't mean now, obviously, for no one ought even to try to go to France unless he has business related to the war or to helping them get on their feet. If a lot of commercial travelers land on the French at this stage, the country from which they come is likely to be rather unpopular. On the other hand, the State Department is prepared to give a real hand to the businessmen whose legitimate business in France means real assistance to the French and to the war effort. But after the war is over, travelers who spend abroad, or relatives who send back remittances, are national philanthropists.

France is a key to the stability and progress of western Europe. We don't expect to mix into European internal affairs, but we are very much concerned that Europe should solve its problems.

The British situation is somewhat different. For three years, from 1939 to 1942, England—not the United States—was the arsenal of democracy. She has been converted to war work to an even greater degree than the United States. As a result, her productive capacity devoted to export trade has been reduced to a startling degree. Her exports for 1942 were 57 per cent of 1938, and in 1943 were 49 per cent. But if you reduced these figures to 1935 prices, then 1942 was only 36 per cent of 1938, and 1943 was only 29 per cent.

To see what this means to our great ally, consider that England had great difficulty in balancing her exports and imports just before the war, and that she spent her balances abroad and much of her investment in paying for the early cost of the war. It was the exhaustion of her dollar balances that made lend-lease necessary. The sterling balances in London of the Dominions (except Canada) and of the sterling area (like Egypt, the Middle East and India) have gone up to nearly 12 billion dollars.

That debt can only be paid by exports. So also the things that England has to have to live, in raw materials, in food, in oil, all these have to be paid for in exports to the extent that lend-lease decreases this year, and in full when it stops at the end of the Japanese war. Part of those things were paid for by foreign investment income which is now gone.

Can you wonder the British are worried? Their best estimate is that their trade will have to be 50 per cent higher than pre-war in order to reach a balance of payments because of the loss of foreign investments, and that means just about five times the trade in 1943. If their emphasis on exports seems extreme, these figures which they published a few weeks ago will show you why.

What can England do in the period while they are getting onto a balanced basis? They have to find some way to even things up during that period by either a sale of assets, or a loan, or an outright sharing of war costs that put them in this state. With the end of the war a sharing of that kind is not likely, but it is certainly very much in the interest of the United States to help finance their operations in the period of restoration. In a sense, this is financing a competitor, but it is also financing our best customer, and financing the nation whose strength means much to our security.

If a nation should move over to state trading, and a managed foreign trade of exports and imports as a permanent policy, we should have to re-examine our position. Obviously, while England is getting back in balance she must ration her dollars, and limit her imports to essentials until her exports catch up with them.

BAMBOO "BIG INCH" carries salt from 2600-year-old mine to refinery in China.
(Photo courtesy Pathfinder)



re again we can help most by look- for the things she makes that we nt and can use.

One field of war costs where we ght well make a substantial con- bution is in helping our great ally rebuild her houses that have fallen bombs and robots and V-2's. uch of her effort that might other- se go into export of goods to pay her essential imports will have to diverted to the provision of per- nent shelter for those grand work- —men and women—who held the t when nobody else was on the against Hitler.

But to come back again to our busi- ss with the area in which sterling he basic international currency, we n't be enthusiastic about other ds of trade restrictions there hich are not related to the British local financial position, but are aight discrimination against Amer- n trade. To fight those restric- ns and talk governments out of em is one of the main businesses of e State Department and its foreign vice. I am happy to say that the ntinuance of any such restrictions certainly not the official policy of e United Kingdom Government, hen they bear no relation to the ortage of dollars, the blocked ster- g balances in London or the lim- d operations of Empire preference.

Seaports like Los Angeles and San ancisco are of course interested in ance and England, but you are ob- ously facing west here, and the re of the far west is in your blood. ducation has taken hold, and with spread develops the certainty of de support of the kind of scientific ricultural improvement, industriali- tion and commercial expansion in hina that raises the true standards living.

After the war there will be new oblems. China's tendency is toward ate control of new industry at least, d the problem of finance will be st as great as in all other parts of e world. Here again the task is to d things we want which can help pay for the things China will ed desperately for transportation d reconstruction. But that cannot ssibly do the whole immediate job, d we are up against our problem of e great creditor nation. What is the und investment policy to finance e industrialization of an agricul- ral country? It is certain, if ex- rience is any guide, that long term ans with low interest rates are the ly ones that get paid in those cir- mstances. The United States is concerned that development in China by Americans shall not be foreign exploitation. That is also the interest of the Chinese Government.

For you on the West Coast, as for others to whom I have spoken in the East, it seems to me that we need a revival of the genius, enterprise and ingenuity in foreign trade associated with the term "Yankee." You in Southern California certainly should come by it honestly, for you stem from New England, via Ohio and Iowa. Your Government is there to help, through the agencies concerned with foreign trade, under the coordination of the State Department, and through the Foreign Service of the United States. But it is not there to do the job for you. If private enterprise means anything it means, "git up and git," without spoon feeding by a Government agency. There were exchange difficulties in the days of the clippers, and state traders and exclusion from markets, and all the rest. Government helped in all that, but the Yankee got the most of it on his own.

IMPORT FINANCING

(Continued from page 38)

or Quality by the designated person. Documents of this latter type have been obtained in some instances, and if this practice should spread, it may become the function of special international organizations to examine and certify shipments. The Certificate of Quality may eventually become a standard document that will be required by importers as well as by banks.

Costly and protracted law suits may be avoided when controversies arise by incorporating in the primary agreement between the buyer and the seller the following standard arbitration clause:

"Any controversy or claim arising out of, or relating to, this contract or the breach thereof, shall be settled by arbitration, in accordance with the Rules then obtaining, of the American Arbitration Association, and judgment upon the award rendered may be entered in any Court having jurisdiction thereof."

While the suggested safeguards will minimize the buyer's risk, his best protection is the integrity of the seller, whose credit and moral standing should be carefully checked before relations are established, and periodically checked thereafter.

Next Month

How Freight Rates Are Developed.

Importance of Passenger Traffic in Foreign Trade.

Proportionate Relation of Imports to Exports

Packing for Air Shipment

Employment in Industries Dependent on Foreign Trade.

And others.

LOS ANGELES PACES WORLD TRADE FIELD

(Continued from page 34)

(10) Assistance given in executing applications for export licenses, import permits, freight space permits, etc.

(11) Speeding up of processing licenses and permits, through the Washington office of the Chamber of Commerce and special arrangements with the Foreign Economic Administration.

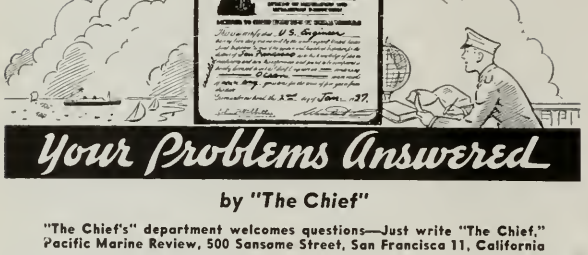
(12) Maintenance of extensive files of basic commercial information on all foreign countries.

(13) Preparation of market surveys for individual firms concerning specific products, as well as general market surveys of broad trading areas.

(14) Maintenance of close liaison between local world traders and Government agencies in the interest of promoting sound Government policies and practical regulations.

In addition to all of the above, there are the World Trade Clinics, the fame of which is already nationwide. These Clinics are extended discussion meetings addressed by leaders in certain fields, who then undertake to answer questions from the floor and clear up uncertainties in the minds of those present. The Clinics are popular, and are recommended to World Trade groups in all cities—[Ed.]

Pacific WORLD TRADE



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisca 11, California

Steering Mechanisms

IV—Modern Electro-Hydraulic Gear

In our December issue this section described the hydraulic telemotor system whereby the movement of the steering wheel is transmitted to the electro-hydraulic gear that actually turns the rudder. Our illustration this month is a diagrammatic representation of the electro hydraulic gear itself. This gear is controlled from the pilot house or other distant steering stations by either the hydraulic telemotor on manual steering or by the electric telemotor in automatic steering.

This type of gear consists of two Waterbury variable delivery main electric motor drive pumps, with piping connecting these pumps with two pairs of cylinders. Each pair of cylinders actuates a ram the center of which is attached to the tiller by suitable linkage. The piping system is so arranged that either pump can drive either or both pairs of cylinders, and either pair of cylinders can be bypassed through the system so as to be inactive. Oil is used as the hydraulic medium.

A manually operated pump is provided and connected to the low pressure piping. This pump is used for draining or filling the system and may be used in emergency for actuating the gear and so steering the ship. Storage tanks for the hydraulic system oil are located in the bases of the pump motors and have a combined capacity equal to 225 per cent of the entire capacity of the hydraulic system.

Automatic relief valves and replenishing valves are provided at or near each pump.

Preparation for Operating

When operation is about to get under way, and before starting either of the pumps, the high pressure system and replenishing tanks should be checked with respect to level of oil. Also, the following instructions apply.

(1) Close valves 13, 14, 15 and 16, which seal off the "low pressure" system from the cylinders.

(2) Open valves 7, 8, 9, 10, 11 and 12. Move control valve levers 41 and 42 to "By-pass" position. (For the present disconnect one end of the rod tying these levers together so that they can be operated independently.

(3) Valves 28, 29, 30, 31, 32, 33, 34, 35 and 36 are to be checked for the closed position, which isolates the Port and Starboard replenishing tanks. Valves 17, 18, 19, 20, 21, 22, 23, 24, 27, 50 and 51 are also to be checked for closed position so as to be ready for any of the variety of functions which may be required of them on a moment's notice.

(4) If the steerer has recently been in operation, with its oil and lurication properly conditioned, and the proper hook up to wheelhouse is made, the motor (either or both) may be started. Then the levers 41 and/or 42 (for the pump or pumps to be used) may be moved to "operating" position. The steerer will then be ready for getting "under way."

(5) The rod connecting together levers 41 and 42 may be connecte if change from one pump to th other, in the minimum time, desired. If, however, it is de sired to operate both pumps a the same time, the rod must h disconnected.

Filling Low Pressure System

When it is necessary to fill syster with oil, first adjust as above indicat ed, then proceed to pump oil fror storage tanks to replenishing tank (55 and 56), first making connec tions as follows:

(a) Open valve (50 or 51) fror either storage tank in moto bases.

(b) Open valves 52, 28, and valv 29 or 30 in either replenishin tank (55 or 56) as desired. Valv 27 should be checked for close position so that oil will be pulle through filter by hand pump.

(c) Then operate hand pump, takin oil from storage tanks and di charging into replenishing tank until they are reasonably full a shown by sight gage glass.

(d) When replenishing tanks (5 and 56) are properly filled, clos valves 28, 29 and 30.

(e) Open valves 31 and 34 for Star board and/or valves 33 and 3 for Port pump. Leave valves 3 and 35 closed, except in an emer gency, when it may be necessar to connect either opposite pum and replenishing tank.

(f) The pumps will now have the cases flooded with oil from th replenishing tanks, and be read to operate as soon as the cylin ders and high pressure syste are filled.

Filling High Pressure System

(a) Open air relief bleeder valves i the top of cylinders A. B., C and D and on the upper side c the four main pipes.

(b) Open valves (at the hand pump 24, 18, 19 and 20. Also ope high pressure valves 7, 8, 9, 1 11, 12, 13, 14, 15 and 16.

(c) Then, by operating hand pum draw oil from the storage tank and pump into cylinders until ai is forced out through bleede valves, which can then be close tightly.

(d) Immediately close valves 13, 1 15 and 16, as well as 50, 51, 2 18, 19 and 20.

(e) Caution: During initial perioc of operation, the bleeder valve may have to be frequentl opened to let out trapped ai Open only on outgoing strok

to avoid sucking in air. Presence of air may be indicated by irregular, jerky movement of rams or by persistent clicking noises in the pumps.

) Loss of oil through packing, air cocks, etc., will be automatically made up by the replenishing valves built into the pumps. The control valves 41 and 42 also have built-in replenishing valves of the shuttle type. Thus there is double protection against what is called "oil lock."

Caution: There must be no water condensate mixed in the oil. See at only clean oil is used.

Operating Rules

Assuming that above instructions ve been faithfully followed, we ɔceed to hook-up for operation by her one of several alternate meth-s, making sure that all the other ethods are completely disconnected d also that Rods 74S and 74P to-her with Bolts 71S and 74P are ad-ted and left permanently in posi-n.

Connections for Steering

) Hydraulic telemotor; insert pin 88; and for Starboard pump insert pin 90 (or pin 89 for Port pump.)

(2) Sperry Gyro Pilot; insert pin 88 in opposite side of lever from telemotor connection, and use pin 90 for Starboard pump (or pin 89 for Port pump).

(3) Boat deck steering wheel; engage clutch 91; and for Starboard pump insert pin 64S (or pin 64P for Port pump).

(4) Trick wheels, Starboard 60S (or Port 60P) may be thrown into gear by a lever on either one, and held by a latch pin. Each controls either one of the pumps, or either can be used for control of both pumps by inserting pins 64S and 64P (clutch 91 must be left open during this hook-up). Also be sure to disconnect telemotor and Sperry unit by removing Pins 88 and/or 89 and 90.

Control Valve Adjustment

Valves (41 and 42) must be shifted to the "by-pass" position toward outboard, and each motor started for a short period to be sure the direction of rotation is according to the indicating arrows. This is necessary because a change in direction of rotation would reverse all controls and operation would be impossible.

(1) Pump control lever for Starboard pump on valve 41 is to be toward midship to be in "operate" position (or lever on valve 42 for Port pump).

(2) On the pump not being used, the lever is moved toward outboard or "by-pass" position.

(3) The rod connecting both levers 41 and 42 must be in place for quick change-over, but if both pumps are to be used at the same time, the rod must be disconnected so as to throw both levers toward midship, or "operate," position.

(4) On the pump not being operated, the motor being shut down, it is absolutely essential that the control valve be in "by-pass" location.

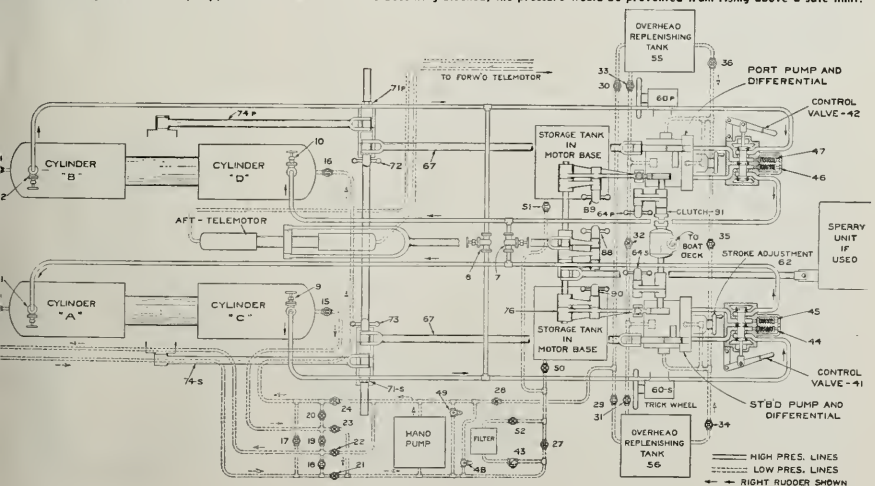
Starting

Starting the motors (either or both) can be done as soon as the foregoing adjustments are made, thus

(Page 90, please)

Key to Diagram

ond 42, the main control valves, are of the quick opening, balanced piston type. They are used to operate or by-pass either pump, and to shift r from one pump to the other. They also can be used to isolate a damaged pump from the system. A rod is provided for interconnection to operate h valves simultaneously. This rod can be disconnected when it is desired to operate both pumps for double speed rudder movement. In an emer-cy, if necessary to remove control valve 41 or 42, or take out a pump for examination, the steering gear can be operated on one ram if the cylinders are by-passed through the low pressure system. 7 and 8 are cross connecting valves used for isolating the port cylinders from the -board system, or vice versa, in case of emergency. 9, 10, 11, 12, 13, 14, 15 and 16 are cylinder stop valves that, when closed, will hold the s in a fixed position if the cylinders are filled with oil. 17, 18, 19 and 20 are valves used for by-passing cylinders "B" and "D," "A" and " "A" and "C," and "C" and "D," respectively. 21, 22, 23 and 24 are valves for selecting the cylinders to be used in emergency hand ring or for isolating the low pressure piping in event of damage. 27 and 52 are valves to be used in passing oil through the filter or by-sing around the filter. 43 is a check valve to prevent flow in reverse direction through filter when pumping into storage tanks. 28, 29, 30, and 31 are valves used when it is desired to fill or drain the replenishing tanks from, or to, the storage tanks. 31, 32, 33, 34, 35, and 36 valves to be used when it is desired to use only one replenishing tank with either main pump, if the other tank is damaged. 44, 45, 46 and are spring loaded relief valves and are integral with main control valves 41 and 42. 48 and 49 are relief valves for protecting the low pressure em when steering with the hand pump, so that in event of one line becoming blocked, the pressure would be prevented from rising above a safe limit.





Steady as you go!

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The Gyro-Compass

Part II. The Four Elements of the Gyro-Compass.

At the conclusion of my first article on the Gyro-Compass I stated that I would next show how the rotation of the earth, and its force of gravity, are hitched to a gyroscope to turn it into a Gyro-Compass. Without taking advantage of these two natural phenomena—the rotation of the earth from west to east, together with the force exerted by its gravitational pull —the gyroscope could not be converted into what it is, "a mechanically operated north-seeking device," i. e., the Gyro-Compass; at least under present scientific achievements. However, before going into the discussion as to how we take advantage, and make use of, these two natural phenomena, we should have a general understanding of the mechanical set up of the Gyro-Compass, principally its four so-called "elements"; the principal parts which go into each "element," together with the job of each in making this gyroscope a Gyro-Compass. Let us now take up each of these "elements" and see how each does its job in combination with the others to make a device which tends to remove a great many of the headaches of the men who sail the seven seas. **(Note:** In the following discussion of the various parts which go to make up a Gyro-Compass I refer to the Mark XIV manufactured by the Sperry Gyroscope Company — the type most commonly used on present-day merchant marine ships.)

(All diagrams courtesy of Sperry Gyroscope Company.)

The Sensitive Element

So-called because in combination with the other elements it reacts to the rotation of the earth and the force of its gravity. It consists principally of a high speed rotor which is the gyroscope proper (not the Gyro-Compass); the rotor case and bearings; the vertical ring; the suspension; the signal bracket, and a spirit level. The rotor itself weighs 55 pounds, with the greater portion of its weight in its outer ring. It turns at a speed of 6000 rpm and operates on 50 volts A. C., which is supplied by a motor-generator driven by the ship's generators. The voltage to the motor-generator is kept constant by a carbon pile voltage regulator. The rotor runs on ball-bearings, and the whole is contained in the rotor case, which is supported on horizontal bearings in the vertical ring. Attached to the vertical ring and projecting out beyond each end of the gyro axle are brackets which support compensating weights that make for an even distribution of weight about the vertical axis of the Gyro-Compass. A signal bracket attached to the "east" side of the vertical ring carries the armature of the "follow-up" element. A spirit level is carried on the "south" side of the rotor case, parallel to the rotor axle, and shows whether or not the axle is horizontal. It is used when starting the Gyro-Compass and setting it on the meridian. The entire sensitive element is supported by the suspension consisting of 18 steel wires secured to stud at the top of the vertical ring which leaves the rotor case and vertical ring free to turn about their vertical axes. Figure 7 is a good illustration of the sensitive element.

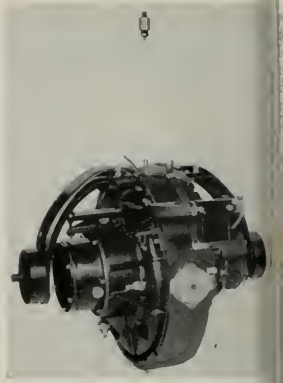


Fig. 7: The rotor case is supported on horizontal bearings in the vertical ring.

The Phantom (Follow-up) Element

So-called because it is that part of the Gyro-Compass which electrically and mechanically picks up the directive force from the sensitive element and carries it to the compass card proper. It consists principally of the phantom ring; the suspension tabl and thrust bearing; the compass card itself (to which is secured the azimuth gear and ring, and the cosine cam groove); the vertical guide bearings, the pick-up transformer, and the slip rings. The phantom element

Fig. 8: The phantom element.



pwer driven, as even though the rective force of the commercial yro-Compass is 150 times greater an that of a magnetic compass, this rective force is not sufficient to op-ate repeaters and other equipment. herefore some other means to pre-nt friction from disturbing the nsitive gyroscope as the ship turns ound it must be provided. In order accomplish this an azimuth motor uses the phantom ring to follow ery movement of the vertical ring that no twist is developed in the re suspension, and the "0" and 80" degree marks of the compass rd, which is attached to the top of e phantom element, are kept in ex-t alignment with the north-south is of the gyro. This system of sup-rt provides a practically friction-is mounting of the sensitive ele-ent. The phantom ring itself is the ng in which the entire sensitive ele-ent is mounted. The suspension ble and thrust bearing are the ounting for the suspension cable. he compass card is a disk graduated om "0" to "360" degrees, from true rth eastward. The azimuth ring d gear are the means by which the antom element is turned in azi-uth to keep it aligned with the sen-ive element. The cosine cam oove, on the under side of the azi-uth ring, is used in correcting for titude error. The vertical guide arings on the upper and lower rts of the phantom ring hold the rtical ring concentric to the phan-m ring. The slip rings, mounted st above the phantom ring, pick up e power supply through brushes hich ride over the grooves. The ck-up transformer on the phantom ng initiates a signal current which amplified to control the azimuth otor in such a way that it causes, I have stated before, the phantom ng to follow every movement of the nsitive element about the vertical is. The phantom element is illus-ated in Fig. 8.

The Spider Element

(The stationary part of the Gyro-ompass which turns in azimuth with e ship itself.) It supports the phan-m element on a thrust bearing so at the phantom element can rotate eely about the vertical axis of the mpass. It consists principally of e lubber ring (engraved with the bber's line, which indicates the ading of the ship); the transmitter; e azimuth motor; trunnion arms, or rackets; an auxiliary latitude cor-ctor and a speed and latitude cor-

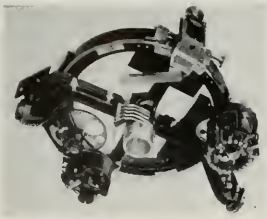


Fig. 9: The spider element.

rector, and several brushes near its center. The lubber ring is concentric to the compass card, and the lubber's line marks the fore and aft line of the ship. The transmitter electrically operates the repeaters and the course recorder. The azimuth motor turns the entire phantom element in azimuth, in response to a signal from the magnetic pick-up. The trunnion arms are brackets upon which the compass is mounted in the binnacle, and the auxiliary latitude corrector and the speed and latitude correctors are devices that turn the lubber ring to compensate for speed and latitude error. The brushes near the center of the spider element engage the slip rings on the phantom stem to carry current to the rotor case to drive the gyro and to the signal transformer to energize the follow-up system. The spider element is illustrated in Fig. 9:

The Mercury Ballistic (or Control) Element

So-called because this is the element of the Gyro-Compass which puts the rotation of the earth and the earth's gravity to work to make a gyroscope a north-seeking device; in other words, a Gyro-Compass. It consists principally of two pairs of mercury reservoirs; two pairs of weighted covers; two horizontal brackets supported on two bearings; two small tubes, and a link arm. One pair of mercury reservoirs are mounted on the east side, and one on the west side of the rotor case. In the Mark XIV compass each pair of res-

Fig. 10: The Mercury Ballistic Element.



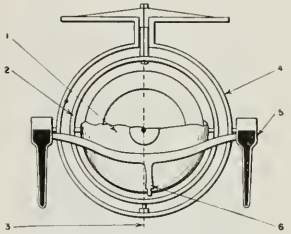


Fig. 11: Elements of the Gyro-Compass. (1) Rotor case; (2) Vertical ring; (3) Suspension axis; (4) Phantom ring; (5) Mercury ballistic; (6) Eccentric stud.

ervoirs contains 8 oz. of mercury. Each pair of reservoirs is fitted with weighted covers in order to give the compass the proper balance, and to make the mercury ballistic non-pendulous about the horizontal axis. Each pair of reservoirs is connected by a small tube, through which the mercury can flow freely in the north-south plane of the compass between the reservoirs on each side. The mercury ballistic is supported from the phantom element on horizontal bearings and is connected to the rotor case by means of an arm attached to the ballistic, known as a link arm, and a bearing secured to the bottom of the rotor case, known as the eccentric stud, which is offset 11/64 inch to the east of the vertical axis of the compass in order to obtain the necessary controlling action about the vertical axis. Figure 10 illustrates the mercury ballistic (control) element, and Fig. 11 shows all of the elements of the Gyro-Compass.

Operating Principles

Now that we have discussed the various elements of the Gyro-Compass let us see first how a gyroscope acts without making use of the Mercury Ballistic (Control) Element, which after all is that element of the compass which takes advantage, and makes use of, the rotation of the earth and its gravity, and then let us see how this element goes to work to convert the gyroscope into a Gyro-Compass.

Assume, for instance, that by means of a rocket you have projected yourself into space beyond the South Pole, and that with a telescope you observe a large gyroscope which has been mounted at the equator with its axle east and west. We will show only the rotor (wheel) and axle of the gyroscope to avoid any confusion. Now, as we all know, the earth re-

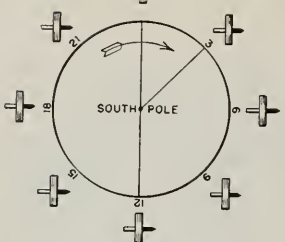


Fig. 12: A gyra with its spinning axis set in the east-west position at the equator appears to turn about its horizontal axis once each 24 hours.

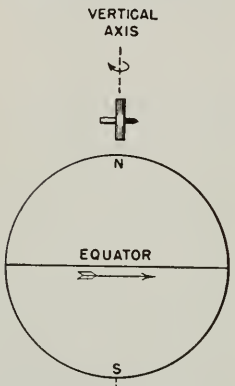


Fig. 13: A gyra with its spinning axis set horizontal at the Pole appears to turn about its vertical axis once each 24 hours.

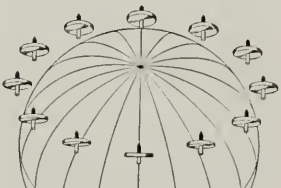


Fig. 14: A gyra with its spinning axis set horizontal at any point away from the equator maintains its plane of rotation in space and apparently moves about both its horizontal and vertical axis.

volves from west to east, making one complete revolution every 24 hours. The gyroscope which you view from space is carried around with the earth, but the gyroscope remains fixed in the direction in which it is pointed in regard to space. However, with respect to the earth, the gyroscope rotates about its horizontal axis once every 24 hours, in a direction opposite to the rotation of the earth.

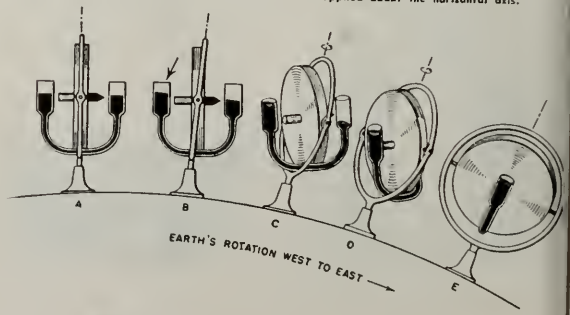
Note in Fig. 12 that while the axle of the gyroscope is parallel to the surface of the earth at the beginning of the earth's rotation, after three hours the axle which was pointed east is **apparently** elevated at an angle of 45 degrees; after six hours, 90 degrees; after 12 hours, 180 degrees, and so on until at the end of 24 hours it is back where it started. If the gyroscope were placed either at the North or South Pole, as illustrated in Fig. 13, it would appear to rotate about its vertical axis. At points between the poles and the equator, as shown in Fig. 14, it appears to turn partly about its horizontal and party about its vertical axis.

The difference between gyroscopic inertia and apparent rotation is simply one of **point of view. As far as space is concerned the gyroscope remains fixed.** With reference to the earth, however, the gyroscope actually rotates as described above, and it is this rotation which makes it possible to apply the force of gravity so as to convert the gyroscope into a north-seeking Gyro-Compass. The first step is to devise some means which will cause the axle of a gyro to precess towards true north—in other words, to cause it to align itself with the north and south meridian To do this a pair of mercury reservoirs has been added, with interconnecting tubes, and this is partially filled with mercury and secured to the phantom ring in such a way that it will tilt with the gyroscope when the gyroscope tilts or rotates about its horizontal axis.

With the gyroscope at the equator and horizontal as at A in Fig. 15, the mercury in the reservoirs is equally distributed and the weight exerted by it is distributed equally; that is, there is an equal pressure on each end of the axle. Consequently, the mercury ballistic has no effect upon the gyroscope. However, as the earth revolves from west to east and the end of the axle which points east (the right-hand end) slowly rises, at lea with reference to the earth, as illu trated in Fig. 12, some of the me cury, by reason of the pull of th earth's gravity, flows into the low end of the axle, as shown in B in Fi 15. In this position a force is put the horizontal axis of the gyroscop the effect of the mercury being th same as though we were to pre down on the west end (the left end of the gyro axle. The result is tha the gyroscope **precesses** about its ve tical axis. as shown by C, D and in Fig. 15, turning counter clockwis As the end of the gyro which at fir was pointing east (which we sha now refer to as the north end), pr cesses, or turns, towards the meridia it continues to rise, this apparent ris being caused by the rotation of th earth. After the gyro axle has turne or precessed, so that it is parallel t the north and south meridian, th excess mercury in the reservoirs an tube at the south end causes the pr cession to continue, and the end the gyro axle which was at first poin ing west (which we shall now refe to as the south end) is carried to th east of the meridian. This south en now commences to rise and the me cury commences to flow back to th north end, precession gradually dim inishing until the gyro axle is agai horizontal and the mercury evenl distributed. At this point precessio of the north end towards the we stops. However, the south end cor tinues to rise, because it is still east the meridian, and finally the mercur in the north reservoirs overbalance the mercury in the south reservoir Precession is therefore reversed, an the north end turns back towards th meridian. The gyro oscillates abou the meridian, each oscillation becom ing less than the previous one unt the oscillations are reduced to a min imum. The gyro axle never comes t rest by use of the mercury ballisti only, and force must be applied at an other point to cause it to settle.

(To be continued)

Fig. 15: Effect of the mercury ballistic when applied about the horizontal axis.





Top row, left to right: G. L. Chrisape, general manager; Orville Dutro, sales manager; Vernan Gray, plant engineer; Hugo Hommermeister, superintendent; Bernard Frohn, production controller. Bottom row, left to right: John Brotherton, shop foreman; Nona Peterkin, office monager; Lee Uden, engineering; Ann Cahill, secretary to general manager; Mildred Taylor, receptionist.

Sturdy, Dependable Equipment for Boat Decks

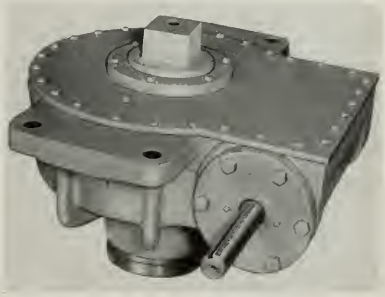
For fifty years the Johnson Foundry and Machine Co. of Los Angeles have enjoyed an excellent reputation as manufacturers of high quality equipment for various industrial uses. One of their lines is deck equipment for yachts, fishing craft and workboats. This line includes well designed and efficient winches and windlasses, as shown in our illustrations. Recently they were asked by a prominent boat builder to produce a standard gear unit for the rudder stock of power boats.

In order to make sure that such a unit would meet the most exacting requirements of boat builders and owners, G. L. Chrisope, general manager of Johnson Foundry, sent Orville Dutro, sales manager and design engineer, to contact boat builders and owners, naval architects and marine engineers on both the Atlantic and the Pacific Coasts. The tabulated information obtained in these contacts revealed a need for a rudder gear unit that would incorporate such features as: a self-locking worm; completely enclosed oil-tight worm and worm gear box; lugs attached to this box for fastening unit to deck; ball bearings throughout; a satisfactory method of removing the rudder post without disturbing the gear unit; adaptability to both power and manual operation; a quick, easy method of attaching and operating an emergency tiller; and ruggedness with dependability.

Designs were made and submitted for approval or further suggestions. They were checked and rechecked, and only after this careful preliminary work was production on the rudder control started.

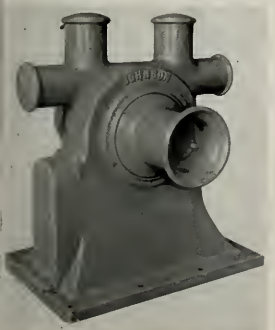
The unit immediately met with widespread approval, and has been adopted by a number of shipyards as standard equipment.

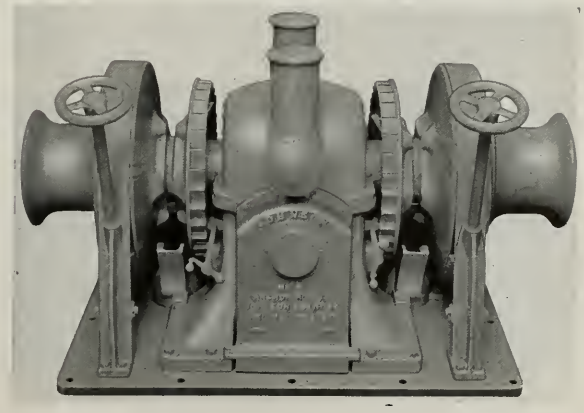
As a result of the many contacts made in connection with the rudder control, the line of anchor windlasses and cargo winches came in for an overhauling. New features were developed. Entirely new models and sizes were produced. Controls were made convenient. To increase efficiency, ball bearings were used wherever practicable. All gears are cut steel installed in tightly sealed housings and operated in oil. Complete stress analysis and balanced de-



Right: Rudder control.
Lower left: Cargo winch.
Lower right: Anchor hoist.

(Meriman Photo Art photos)





sign to eliminate excess material and weight has resulted in powerful, compact units assuring the greatest possible value and utility.

Planned engineering has made many parts interchangeable, so that it is often possible to build a winch of a different type almost entirely from stock parts. For example, when recently requested to make a new type of drag-net winch, it was merely an assembling job, using stock parts except for a special base and shaft. This makes it possible to produce these parts on a larger production basis, thus giving greater values in the Johnson winches than would otherwise be possible.

The high-grade workmanship which has been maintained in the plant throughout the war period has been due in a large measure to the loyalty of top-ranking machinists, some of whom have been with the company for many years. Under the able leadership of Hugo Hammermeister, general superintendent, these men have done a big job in the war effort.

New 40-foot to 160-foot boats, in rapidly increasing numbers, are installing distinctive stream-lined Johnson deck equipment.

A Hurricane Requires Dependable Anchors

The recent hurricane off the New England and Florida coasts furnished dramatic evidence of the holding ability of Danforth anchors.

One of the most interesting experiences was described by a Navy officer on an AMC in a personal letter to William S. Danforth, which describes the performance of Danforth anchors as used by AMC's and YMS's during the Florida storm. Quotations from the officer's letter are as follows:

"Thought you might be interested in learning that we rode through the recent hurricane on a Danforth. She held remarkably well and so far as we know we did not drag an inch.

"Two other AMC's which were not using your anchor had quite a lot of trouble and one of them went aground.

"The hurricane hit us in the afternoon and lasted four hours with winds of 120 miles per hour in the peak. Several other ships around broke loose at the height of the storm and nearly all the ships except the YMS's dragged anchors considerably. Every YMS was equipped with your anchor and not one of them had a bit of trouble.

"The officer in charge of the minesweep task unit here made several complimentary remarks about the anchor yesterday and said he hopes to have Danforth anchors for every minesweeper here after seeing what a great job they did in the hurricane."

Another story comes from a fisherman, Captain George Berg of Mystic, Connecticut, who describes how his 75-lb. Danforth held his 55 ft. Tip Top and a sister ship. Both of these 34-ton craft have a beam of 16 ft. and a draft of 7 ft. Captain Berg states:

"During the September 14 hurricane at 9:30 p.m., half an hour before the height of the storm, we could see that it was necessary to get away from the dock, and we did so. As soon as we were past the end of the dock, we anchored. We couldn't see anything anyway.

"We used a 3½" manila rope spliced into a thimble. We let out 25 fathoms. The wind was blowing North East at about 80 miles per hour and we were in 20 feet of water.

"The Carl J., a sister ship, was pounding against the dock. She had no anchor. We swung her a line and hauled her away. When the wind shifted unexpectedly North West, we turned sharply. We both lay with the one 75-lb. Danforth and did not drag.

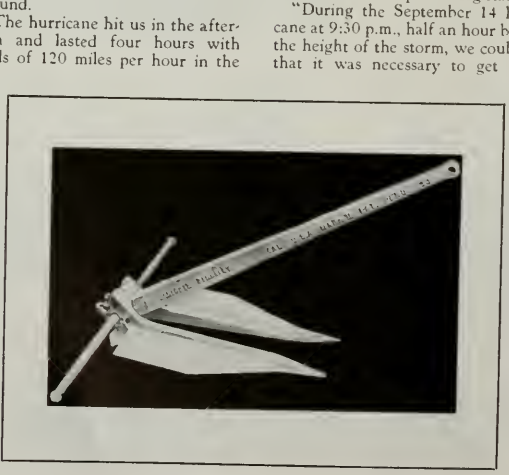
"The anchor came up easily the next morning and the rope showed how deeply the anchor had buried itself in the soft muddy bottom.

"To us this was a remarkable feat because one of the other draggers, a lighter boat, had a 200-lb. regular type anchor and dragged dangerously throughout the storm.

"A 75-lb. Danforth that held two 34-ton draggers is the best recommendation I could give or receive. I've never seen anything like it. I'd go on record any time to recommend the Danforth anchor."

A. E. Fraser of the Stonnington Boat Works reports this hurricane experience of one of his customers, a fisherman, as follows:

"One of the boats we had supplied with a 75-lb. Danforth, anchored in the harbor. It is a 56-ft. boat of 20 tons and lay to 50 fathoms of 7/16" 6 x 19 wire rope with two lines bent on the anchor as a precaution. The wind was 90 miles in the puffs, but as the captain found she was riding easily and not dragging, he set a watch on deck to check bearings and went below and turned in."





Activities of the Marine Exchange

By M. A. Cremer

Election of Officers

At a special meeting of the 1945 Executive Committee of the San Francisco Marine Exchange on December 6, 1944, the following officers for 1945 were chosen:

Roy C. Ward, President; Allan K. Fulme, First Vice President; Edwin Macfarlan, Second Vice President; Herman H. Pierson, Third Vice President; John T. Greany, Treasurer.

Directors recently elected to serve for the two-year term 1945 and 1946 are: Leo P. Bailey, Manager, Steamship Dept., Balfour-Guthrie & Co., Ltd.; William F. Minehan, Assistant Vice President, Bank of America; John Parker, President, American Marine Paint Co.; H. H. Pierson, Pacific Coast Manager, De La Rama S. S. Co., Inc.; Roy C. Ward, Vice President, Cosgrove & Co. and Comdr., U. S. Coast Guard, R. T. Commanding Volunteer Port Security Force.

Hold-over directors who will continue to serve through 1945 are: Joseph J. Geary, Admiralty Attorney, Allick, Geary, Olsen & Charles; John T. Greany, Manager, Marine Sales, Bethlehem Steel Co.; Allan K. Fulme, Vice President, General S. S. Corp., Ltd.; A. B. Johnson, Jr., A. B. Johnson Lumber Co.; E. J. Macfarlan, Assistant Manager, Foreign Department Standard Oil Company of California; Andrew G. Townsend, Marine Manager, Matson Navigation Co.

Sailing Vessel Model

Rated by experts as the best ship model ever seen on the Pacific Coast, here is now being exhibited on the Exchange Floor by the San Francisco Museum of Science and Industry a model of the five-masted, square-rigged Preussen.

With all her canvas set, the exquisitely made model is charming all those who come to the floor. Old sailing ship men, as well as those who know little of ships, marvel at the workmanship that created her and the beauty of her lines.

The model was made in San Francisco by Eric Swanson, who spent about four years in her construction. She is built on a scale of 1/4 inch to the foot, after official plans.

The original of the model was the "Queen of the Nitrate Trade Clippers." She was built by J. C. Teclenborg of Gestemunde in 1902 for Ferdinand Ladisz and Company of Hamburg. She was lost as the result of a collision on the Goodwin Sands on November 10, 1910. She was 407.8 feet long b.p., 53.8 ft. beam, 27.1 ft. depth, deadweight cargo capacity 8000 tons, displacement 12,000 tons, best speed record 17 knots.

Mr. Swanson, who sailed before the mast for many years, and who is now a longshoreman, selected the Preussen because "she had more of everything than any other vessel of her kind." The model, complete to the last detail and even including figurines of the crew, proves this.

Model Contest

To further the interest of American youth in our merchant marine, the Women's Organization for the American Merchant Marine, Port of San Francisco, a non-profit, non-commercial group, is sponsoring a Victory Ship model building contest among 12- to 14-year old Boy Scouts of Scout Region Twelve, comprising California, Arizona, Nevada and Utah.

First prize will be a trip to San Francisco and return for the winning boy and his mother, plus $100 expense money. In addition, the first prize winner may designate his mother, sister or some other woman to sponsor a merchant ship at its launching in the San Francisco area on or about April 15, 1945, during Boy Scout Anniversary Week. Second, third, fourth and fifth prizes will be $100, $75, $50 and $25 War Bonds respectively.

The contest will end on April 1, 1945, by which date all models must have been received by M. A. Cremer, manager, San Francisco Marine Exchange, 465 California Street, San Francisco.

At the conclusion of the contest, all models entered will be on public display at the Marine Exchange.

Complete contest rules and directions are obtainable from Scout Masters throughout the four states comprising Region 12, Boy Scouts of America.

India Exhibit

During the latter part of December there was on display on the Exchange Floor an exhibit portraying India.

Panels of photographs, maps, pictographs and motion and sound pictures were used to indicate the progress of self-government, the life and activities of the people.

Emphasized was the fact that every fifth person in the world is an Indian, the size of India's armed forces—the world's largest volunteer army, the leadership of India in irrigating land for cultivation, the development of Indian industries (India has the biggest single steel plant in the British Commonwealth) and the large part that India is playing in the war effort.

Directory of Members

The Exchange has in course of preparation a classified directory of its members, which will be placed in circulation in January, 1945.

It will contain a large number of new members whose applications are being reviewed.



Model of five-masted sailing ship "Pruessen," built by Eric Swanson.

On the Ways—

SHIPS IN THE MAKING





M/S BREVARD LAUNCHED AT KAISER'S YARD 4

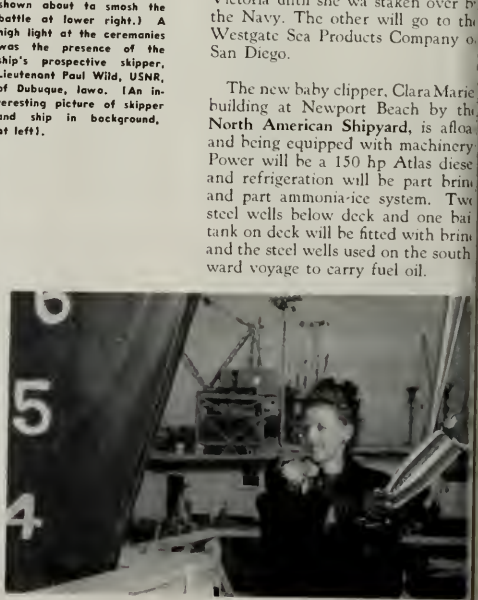
At the simple but impressive launching of the Motorship Brevord, the ninth of o series of diesel propelled motorships being constructed ot Kaiser Company's Yard 4 in Richmond, California, Mrs. Jack Wieringa, wife of the outfitting superintendent of the yard, christened the vessel on November 18. (She is shown about to smosh the bottle at lower right.) A high light at the ceremonies was the presence of the ship's prospective skipper, Lieutenant Paul Wild, USNR, of Dubuque, Iowo. (An interesting picture of skipper and ship in background, at left).

New Fishing Boats Under Construction

The new 116-foot tuna clipper fo Manuel Rosa, owner of the famou Lusitania, was launched at the Lyn Shipbuilding Company, San Dieg on December 16, bearing the nam Portuguesa. The vessel was chistene by the owner's daughter, Mar Speakers at the ceremony include George Wallace of the Tunaboa Assn.; State Senator Edward Fletch er; Frank Lynch, president of ship yard, and Art Ponsford, writer an lecturer. This new tuna clipper is o wooden construction with all brin refrigeration and powered with a eight cylinder Enterprise engine an two Caterpillar diesel auxiliary en gines.

Captain Matt Monise has left Sa Diego, where he was until recentl port captain for the Westgate flee and has gone to Stockton to super vise the construction of two 140-foot all steel tuna clippers ordered fron **Clyde W. Wood, Inc.** These vessel will be powered with an 850 h supercharged Washington diesel en gine each. One of these vessels wil be owned and skippered by Captai Monise, previous owner of the clippe Victoria until she wa staken over b the Navy. The other will go to th Westgate Sea Products Company o San Diego.

The new baby clipper, Clara Marie building at Newport Beach by th **North American Shipyard,** is afloa and being equipped with machinery Power will be a 150 hp Atlas diese and refrigeration will be part brin and part ammonia-ice system. Tw steel wells below deck and one bai tank on deck will be fitted with brin and the steel wells used on the south ward voyage to carry fuel oil.







Mr. and Mrs. Austin W. Sperry on the launching platform at Moore Dry Dock Co. just before the christening of the SS Golden Racer. At right: The C-2 type vessel, Golden Racer, sliding down the ways.

J. W. Williams' new boat, Cora Ann, a 73-foot brine boat powered with a 150 hp Atlas diesel, is nearing the launching date at **Harbor Boat Works**, San Diego. Auxiliary power will be supplied by two 60 hp Caterpillar diesels each driving 30 kw generators. Cost of this vessel will be approximately $95,000.

An interesting rebuild and conversion is the boat, City of Naples, on which approximately $100,000 is being spent at the **Campbell Machine Company**, San Diego. This was a 70-foot purse seine boat of the same name and was bought by Frank Buono and associates of San Diego. She was stripped out and the sheer line raised 11½" amidships and flattened to provide better freeboard and trim when fishing for tuna. The original 135 hp Atlas diesel has been retained, but two 60 hp Caterpillar diesels each driving 30 kw generators installed and all auxiliaries driven by electric motors. Everything is new from the sheer line up, including deck house, bait tanks, bulwarks and decking. This is a fine looking boat and should prove efficient in her new service on the tuna banks.

Intercoastal Lines Make Post-War Plans

The Isthmian Line recently completed arrangements with the San Diego Harbor Commission for their old office and dock space on Pier B, to take care of their vessels operating between Portland, Maine, New York, Philadelphia, Baltimore and San Diego and other West Coast ports.

Leo E. Archer, manager of the Moore-McCormack lines, is negotiating for dock and office space for their Pacific Republic Line ships, a subsidiary, operating from the West Coast to ports on the east coast of South America via the Panama Canal.

The McCormick Steamship Company is planning on dock space for the resumption of their coastwise general cargo and lumber business.

Golden Racer Sponsored By Mrs. Austin W. Sperry

The SS Golden Racer, launched September 29 at Moore Dry Dock Company, was sponsored by charming Mrs. Austin W. Sperry, wife of the assistant manager of the Crane Co. of San Francisco, and who, in her own right, is well known in San Francisco society as an active participant in British War Relief before the war and later the Red Cross, after the two divisions amalgamated.

During the after-launching reception, James R. Moore spoke of the fittingness of having Mrs. Sperry as sponsor of the ship, since her husband has been socially associated with the yard's management for many years. Austin Sperry sang for the San Francisco Opera Assn. for five years, and it is his skill and personality that add to the gaiety of launching receptions when he sings rousing songs reminiscent of pirates and old-time sailing vessels.

The SS Golden Racer is named for the medium clipper ship built in 1852 in Maine, and although the clipper was lost on her third voyage she made a creditable record on her short career. Arriving at Shanghai, May 16, 43 days out from San Francisco, she was stranded in the River Min and became a total loss.

Two Steel Tuna Clippers

The Soule Steel Company of San Francisco recently laid the keels of two tuna clippers for the Van Camp Sea Food Co., of Terminal Island, Los Angeles.

These vessels will be 138′ 0″ in length overall, 130′ 0″ length on load line, 32′ 0″ beam, 15′ 3″ molded depth, and a mean load draft of 12′ 9″.

They will carry 350 short tons of fish frozen, a fuel oil supply of 41,500 gallons, a lubricating oil supply of 1400 gallons, and 3400 gallons of fresh water. Accommodations will be provided for a crew of fourteen men and three officers.

The hull will be of all welded steel construction and will be built to American Bureau requirements.

The propulsion machinery of the first consists of a 560 bhp Union Diesel engine capable of driving the vessel at a speed of 10½ knots. The second clipper will have an Enterprise Diesel of 720 bhp installed.

The first vessel will be launched early in February, 1945.

W. C. Nickum and Sons, naval architects of Seattle are the designers of the vessels.



Launching of the LCS (L) 89 on December 7, 1944. Sponsor was Mrs. Edward May, wife of CIW's manager of materials. Speaker was Colonel W. D. Jackson of Oregon's Sunset Division. The ship was built at Commercial Iron Works, Portland, Oregon.

Some Pacific Coast Launchings

Launched from November 15 to December 15:

California Shipbuilding Corporation, Wilmington, California:

24th attack transport, SS Buckingham, launched November 13.

25th combat loaded transport, SS Brookings, launched November 20.

26th attack transport, SS Clearfield, launched November 21.

27th transport, SS Clermont, launched November 25.

28th attack transport SS Clinton, launched November 29.

29th attack transport, SS Colbert, launched December 1.

30th attack transport, SS Collingsworth, launched December 2.

399th ship, SS Jericho Victory, launched December 6.

400th ship, SS Koloa Victory, launched December 12.

401st ship, SS Cody Victory, launched December 15.

Commercial Iron Works, Portland, Oregon:

83rd ship, LCS, launched November 17.

84th ship, LCS, launched, November 19.

85th ship, LCS, launched November 19.

78th ship, AN, launched November 29.

86th ship, LCS, launched November 30.

87th ship, LCS, launched December 3.

88th ship, LCS, launched December 3.

89th ship, LCS, launched December 7.

Consolidated Steel Corporation, Ltd., Wilmington Shipbuilding Division:

USS Cullman, combat transport, launched on November 18.

USS Lawson, combat transport, launched November 27.

(Please turn to page 88)

Merchant Shipbuilders' November Deliveries

Of the 154 ships delivered in November, totaling 1,430,660 dead weight tons, the U.S. Maritime Commission announced that this production was the second highest in 194 boosting the year's total to 15 ships with an aggregate of 14,98 538 deadweight tons. They built military types for use of the arm forces, and nine Victory cargo, fi standard C-type cargo, 22 standa tankers, 11 coastal cargo, three co crete cargo, and 48 Liberty car ships.

West Coast shipyards lead in ou put with 60 vessels, including military types. East Coast yar turned out 46, with 13 of them d signed for the armed forces. Yar in the Gulf Coast built 39 ships, a the Great Lakes' yards delivered ni coastal cargoes.

The number and types of vesse built during November follow:

Shipyard	No. of Vessels	Type of Vessel
Alabama Dry Dock & Shipbuilding Co.	5	Tankers
Bethlehem-Alameda Shipyard, Inc.	1	Military Type
Bethlehem-Fairfield Shipyard, Inc.	5	Victory Cargo
Bethlehem-Sparrows Point Shipyard, Inc.	1	Naval Tanker
	1	Military Type
California Shipbuilding Corp.	6	Military Type
Consolidated Steel Corp.	1	C-Type Cargo
	5	Military Type
Delta Shipbuilding Co., Inc.	8	EC2 Cargo
East Coast Shipyards, Inc.	3	Naval Tankers, Coastal
Federal Shipbuilding & Dry Dock Co.	1	Militar Type
Froemming Brothers, Inc.	1	Coastal Carco
Globe Shipbuilding Co., Superior, Wis.	2	Coastal Cargo
Gulf Shipbuilding Corp.	1	C-Type Cargo
J. A. Jones Const. Co., Inc., Brunswick, Ga.	6	EC2 Cargo
J. A. Jones Const. Co., Inc., Panama City, Fla.	6	EC2 Cargo
Kaiser Cargo, Inc.	1	Coastal Cargo
Kaiser Company, Inc., Swan Island	6	Tankers
Kaiser Company, Inc., Vancouver	9	Military Type
Leathem D. Smith Shipbuilding Co.	2	Coastal Cargo
Marinship Corporation	4	Tankers
	1	Naval Tanker
McClaskey & Company, Tampa, Florida	3	Concrete Cargo
Moore Dry Dock Co., Oakland, Calif.	1	C-Type Cargo
North Carolina Shipbuilding Co.	4	Military Type
New England Shipbuilding Corp.	9	EC2 Cargo
Oregon Shipbuilding Corp.	11	Military Type
Pennsylvania Shipyards, Inc., Beaumont, Texas	1	C-Type Cargo
	1	Coastal Cargo
Permanente Metals Corp.	9	Military Type
	4	Victory Cargo
Pusey & Jones Corp., Wilmington, Delaware	1	C-Type Cargo
St. Johns River Shipbuilding Carp.	6	EC2 Cargo
Southeastern Shipbuilding Corp.	5	EC2 Carga
Sun Shipbuilding & Dry Dock Co.	7	Tankers
Todd-Houston Shipbuilding Corp.	8	EC2 Carga
Walsh-Kaiser Co., Inc.	3	Military Type
Walter Butler Shipbuilders, Inc., Superior, Wis.	4	Coastal Cargo
Western Pipe & Steel Co.	1	Military Type

ckingham County onored

Mrs. Samuel J. Dickey, wife of the sident of General Petroleum Corration, christened the 455-foot nsport, SS Buckingham on Noember 13, at California Shipbuildg Corporation yard on Terminal and. This is one of the 30 attack nsports being built by this yard.

The vessel, named for Buckingham unty, Virginia, slid down the Calip ways which were thickly coated th a special type of grease manutured by the General Petroleum rporation. They have supplied much of the launching grease used by Calship in launching over 400 ships. From 2000 to 10,000 pounds of the grease is required for each launching.

Tacoma Launches Giant Carrier

Shrouded by a heavy early morning fog, the giant aircraft carrier U.S.S. Vella Gulf slipped into the waters of Puget Sound at Todd-Pacific's Tacoma yard.

The huge flattop is the seventh in a series of sisterships built at the Todd yard for the Navy, and the 60th vessel constructed by the company since the beginning of the war. Sponsor of the Vella Gulf was Mrs. Donald F. Smith, Falls Church, Va. Mrs. Smith is the wife of Captain Donald F. Smith, director of the naval air transport service in Washington, D. C.

Ingalls Launches Million Tons of Ships

The Ingalls Shipbuilding Corporation Yard at Pascagoula, Miss., celebrated the launching of one million tons of ships for war use recently as the S.S. Sea Adder, 18,000-ton all-welded transport slid down the ways. It was the 59th ship in 53 months.

Mrs. Samuel J. Dickey christening SS Buckingham. (L to r): Samuel Dickey, pres., General Petroleum Corp.; Mrs. A. H. DeFriest, wife of e pres. Gen. Pet. Corp.; John A. McCone, pres., Calship; and (behind nsor) B. Brewster Jennings, pres., Socony-Vacuum Oil Co.

SS Inglewood Hills, named for a Calif. oilfield, is powered by 8250-turbo-electric drive and is one of Marinship's 523-foot tonkers. (Marin-Photos courtesy of Yard.)

Mrs. George Mayo, wife of Lt. Col. Mayo, on Nov. 26 christened a 380-ton troop transport, named in honor of her father-in-law, the late miral H. T. Mayo. Ship built at Bethlehem-Alameda Shipyard, Inc.

USS England (DE), built at San Francisco yard of Bethlehem Steel ., was recently awarded the Presidential Unit Citation. (Official Navy oto.)

Inglewood Hills launching party. (L to r): Chaplain M. D. Merchant, Col., USA, who offered invocation; Don S. Lind; Mrs. Lind, sponsor; ss Lucille Hannell, maid of honor; Marine Corps bugler; and Chas. H. y, Emcee and asst. prod. mgr at Marinship.











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Above: Model showing new type of superstructure using corrugated pressed metal panels developed at the Ingalls Shipbuilding Corporation yard at Pascagoula, Miss.

Left: The wheel house, a 42-ton unit, being hoisted into place at Ingalls.

New Type Deck House Construction

A new type of corrugated pressed metal superstructure which eliminates numerous stiffeners and many feet of welding required in construction with flat plate has been developed at the Ingalls Shipbuilding Corporation yard at Pascagoula, Miss.

In announcing what is believed to be the first superstructure of this type designed for the famous C-3 ships, Ingalls officials declare that this new design saves time, decreases the man-hour cost and makes assembly easier.

The corrugated plate itself provides the support that formerly was obtained through the use of stiffeners; this eliminates the necessity for welding many points and sections, with a resulting saving in man-hours and production time for straightening distortions.

Although there is no difference in the overall weight of the deck house when corrugated plates are used, there is a definite advantage in the methods of constructing and erecting the superstructure, which makes possible easier assembly and a better job by decreasing the number of steps necessary.

The corrugated plates are prepared at the company's fabricating plants in Birmingham, Ala. They are then shipped by rail 350 miles to the Pascagoula yard to be assembled and lifted into place atop the all-welded ships that Ingalls is sending to war.

Design of this new type of deck house emphasizes streamlining, the horizontal lines tending to minimize the height and bulkiness of the superstructure. Those officials of steamship lines who have examined the results agree that it may be a preview of post-war ships.

These new superstructures are being assembled and installed aboard 18,000-ton transports.

Running LIGHTS

WHO'S WHO Afloat and Ashore

Edited by B. H. Boynton



Former Olympic Skier Now Todd Official

Rolf Monsen, newly appointed head of the Los Angeles Office of the East Todd Shipyards Corporation, is director of customers relations in Southern California, working in coordination with the Repair Division. He comes to the West Coast from the Todd Yards in New Orleans, and now makes his headquarters on the seventh floor of the Richfield Building in Los Angeles.

Monsen is also widely known in the athletic world, having had the honor of being a member of three U. S. Olympic Ski Teams, representing this nation in competition with national champions of all the world at St. Moritz, Switzerland, in 1928; at Lake Placid, New York, in 1932; and at Carmisch - Parten Kirchen, Germany, in 1936.

Being the only member of the team with three Olympic Games to his credit, he was chosen and given the honor of carrying the American flag at the grand opening parade of the various nations in Germany just eight years ago. Having won more than 100 trophies and medals since 1922, including the U. S. Eastern and Canadian Championships in jumping and cross-country racing, and having had military training himself, he was engaged by the U. S. War Department as one of its very first civilian instructors to train the American Ski Troops at Lake Placid, N. Y.



Top: Rolf Monsen instructing a group of American Ski Troops at Lake Placid. Right: an interesting shot of Rolf Monsen taken by Obie Monahan at Lake Placid.



Three Seasoned Blades OF SHIP PROPULSION

George Barr *Dick Monges* *"Dad" Le Count*

By G. A. Bradford

Artist, Cattec Bradford

LIKE THE WELL-pitched blades of an efficient propeller, these men have guided themselves and the company they represent through two score years of marine propulsion activity and, like the service records of veteran ships, their careers reflect the loyalty and integrity that is accorded them by men throughout the length and breadth of the shipping industry. For the most part they are contemporaries of each other, but the variations in their respective backgrounds adds to the colorful story of their achievement.

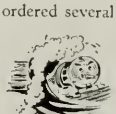
Dick Monges, the executive engineer of the triumvirate, dates back to 1899; George Barr, whose reputation as an authority on the installation and repair of marine engines is undisputed, arrived in San Francisco in 1918; and C. M. "Dad" LeCount, the salesman and contact man of the bunch, has been active in his field of the industry since 1918. Together these three have worked in some of the "firsts" in shipbuilding development. In the early '20's it was the installation of the first diesel-electric and turbo-electric units on ferry boats. About the same time the first synchronous motors were put aboard four Coast Guard vessels of the Tampa class.

In 1931, it was the first of the United Fruit vessels, those of the SS Talamanca type. And since the outbreak of the war—but let's talk about the men individually.

Dick Monges has been active on this coast for the longest period. After having completed one career with retirement from the General Electric Company in 1932, he rejoined them at the outbreak of war in 1941 and has remained as their Consultant on Federal and Marine Engineering ever since. Dick graduated from the University of California in 1896 and in 1909 was named Local Engineer in Portland.

His services in Portland didn't begin, however, until after he'd served a six months' stint in the Spanish American War. Monges makes no claim to "San Juan Hill" experience since he never got out of Florida but, even so, all was not beer and skittles. As a matter of fact the diet ran more to blackberry brandy followed by dysentery and, since this locally-made beverage was almost universally indulged in, about 90 per cent of the men were hospitalized.—Reports are that no wound stripes were issued.

While in Portland, Dick had the opportunity to work on the development of an electric motor application that is being universally used aboard ships at the present time. One of the foremost manufacturers of steam deck winches in those days thought that electric-driven winches could be used to advantage and accordingly ordered several ordinary GE motors of the type that was then being used on land for crane and hoist work. Following their delivery, it was Monges' responsibility to test, revamp, and test, until satisfactory performance was achieved. Designed for land use though they were, performance was so satisfactory that Standard Oil decided to put them on their tankers. But that was a "hole from another hull."



The originals had been installed on the old lumber schooners, S.S. Oregon and S. S. Alabama, whose decks were sufficiently off the water so that tarps could adequately protect that from the heavy spray received. But when this same equipment was immersed in the green seas shipped so regularly on tankers, the soaking was just too much. However General Electric by this time was greatly interested in the marine winch and designed a completely enclosed motor that could withstand the most severe dousings.



Many of the pioneering activities in Monges' career were shared by the other two members of the ast. It was George Barr, for instance, vho, after working on the Coast Guard installations, sailed around to Washington, D. C. on the last one ompleted, the S.C.G. Modoc. As a natter of fact, George has spent bout as much time at sea as he has shore, further qualifying him as the an with the answers on maintenance nd repair.

Born in Paisley, Scotland in 1881, George Barr still retains a pungent burr" in his speech and a Highland winkle in his eye. It was in 1909 hat he joined the General Electric n their Turbine Department at chenectady, where he worked on heir first set of reduction gears, but is experiences before that time make nteresting reading, too.

After his graduation from Paisley echnical on the "Bonnie banks o' Clyde," he joined the British-India team Navigation Company and iled the waters of the Far East. unning his Majesty's mails up hrough the furnace heat of the Per- an Gulf, shipping rice from Ran- oon to China, plying the coolie ade from Burma to the East Coast India, calling at all of these roman- e-sounding ports was just part of he day's run as far as George was ncerned.

Though this Scotsman never has en able to keep his feet dry for a ry long time, the "stranded" pe- ods are not without their own high- ghts. When Barr started his shore ork in Schenectady, it was to help uild the main propulsion turbine- nerator for the U.S.S. Jupiter, the rst electrically propelled sea-going ssel. (She was later rechristened e aircraft carrier, U.S.S. Langley, id was sunk in the South Pacific.) was in 1918 that he first put foot California when he was sent here GE to super- se installation turbines and ars in 46 of ose famous old



stroyers, many of which we turned er to the British not so many nths ago.

These are some of his land jobs d it is the fill-in years that are so erally studded with shake-down ises—always for the same com- ny but aboard a multiplicity of ships: the S.S. President Hoover from San Francisco to Manila; Ferryboats San Leandro and Hayward, under their own power from San Pedro to San Francisco; the S.S. California from New York to San Francisco; the destroyers U.S.S. Smith and U. S.S. Preston to Australia and New Zealand — and these by no means complete the list.

When it comes to Dad LeCount and his part of the activity, the "seamanship" that tips the balance lies in knowing the men who build the ships as well as the type of equipment that will best do the job. Though Dad has done all of his sailing within the twelve-mile limit, his name is a familiar one to the men who give the go signal to ship construction.

Dad's an old Stanford man and the paternal "monicker" goes back to his college days when he managed a boarding club on the campus. He graduated in the class of 1911 and joined the General Electric Company two weeks after graduation. They took him to Schenectady first and then sent him to work the Nevada gold and silver mines. Things were pretty rough in those days and a salesman had to be an engineer and gambler in the same breath, but Dad says those years in Reno and vicinity have stood him in good stead for a port captain's variety of cut-throat pinochle and he's in for more than his share of that as ex-president of the Propeller Club.



When he first came to San Francisco, LeCount's assignment was in the lumber industry and his work in promoting electric logging to lumbermen greatly speeded and increased the amount of power used in that field. He looks back on the "big three" era with considerable nostalgia since it gave him a chance to indulge in his favorite pastime—fishing. He managed to work the streams throughout California and Nevada but has more recently developed an ardent interest in salmon fishing.

This of course ties in with his marine work. It was in 1926 that Dad went into marine sales and one of his first promotions was the four Grace Line Santa ships. These were among the first large passenger-cargo vessels to be powered by double reduction geared turbines. Dad also had considerable to do with the sale of the propulsion equipment on the President Hoover and the diesel-electric ferryboats.

All of these somewhat historical facts concerning the three blades are very interesting, but are virtually dwarfed by their activities during the present wartime period. Since the beginning of shipbuilding program in 1942, GE propulsion equipment has been installed on 208 new ships of various types in San Francisco Bay shipyards. The combined total capacity (propulsion and auxiliary) installed, engineered, or sold by these three men, plus what is now contracted for, amounts to over 2,500,000 shp. Obviously this figure increases as the war requirements are augmented. When you compare this figure with the Pacific Gas & Electric Company's 2,350,000 hp, which represents their aggregate generating capacity, you get an idea of the size of the job which is being done.



The figure of 2,500,000 hp represents new construction only. Repair and maintenance work on over 290 ships since 1942 should be added to really get the full story. At the moment the rate is 25 ships per month, ranging from the largest aircraft carriers, through troopships and destroyer escorts to seagoing tugs.

These figures, and many that cannot as yet be published, tell the story of achievement that can be so closely associated with the activities of Dick Monges, George Barr and "Dad" LeCount. Together they have nucleated an organization which, like the men themselves, warrants the respect and admiration of the shipping industry, and it is completely without reservation that their company respectfully tips its hat to three men who have done—and are still doing —a grand job.

Berry E. Dunn Takes on New Line

Berry E. Dunn, the well-known California representative of the Kearfott Engineering Company, has been recently appointed representative of the Torrey Roller Bushing Works of Bath, Maine, manufacturers of marine air ports and hardware.

His office is located in the Rialto Building, at the corner of New Montgomery and Mission Streets, San Francisco.



Joseph J. Coney, president of Deconhil Shipping Company, general agents for War Shipping Administration, addressing the assemblage at the November Tanker session at the Port of San Francisco.

"TANKER DAY" WITH THE PROPELLER CLAN

"Tanker Day" was one of the four star attractions at the Port of San Francisco Propeller Club's November 15th meeting. San Francisco operators of our oil tankers were well represented.

One prominent operator's representative, Joseph J. Coney, president of the Deconhil Shipping Company, was guest speaker. He presented an excellent paper on "Oil Transportation by Tanker," tracing the tank ship from its origin through its early and present day stages of development and design. His description of the magnitude of the task performed by tankers, their operators and crews in the war effort was greatly appreciated by the assemblage present.

During the meeting Club President Fred L. Doelker introduced members of the tanker concerns present. Among the representatives were:

Standard Oil Company of California
J. H. McEachern, A. E. Kihn, Capt. T. W. Peters, M. H. Jaehne, K. W. Ingraham, L. Simonsen, B. D. Robertson.

Deconhil Shipping Co.
J. J. Coney, C. A. Ames, J. D. Watson, J. Granville, F. Pilla Stanley Hiller, W. C. Ball, F. Rus L. Foster, K. Rustad.

Tide Water Associated Oil Co.
A. B. Haney, W. E. Kammere H. J. Wilson, D. L. Rigden.

Los Angeles Tankers of General Steamship Corp.
A. K. Hulme, Capt. J. R. Morte sen, R. V. Winquist.

Pacific Tankers, Inc.
Andrew Neilson, A. A. Layn Wm. Taylor, Allen Cameron, W. W. Anderson, C. M. Cox, J. M Baird.

Then the president gave a conci and interesting review on the pr ceedings of the annual Propell Club's convention in New York fro which he had just returned.

A stirring feature of the day w the presentation of the Merchant M rine Distinguished Service Medal Captain D. P. Baird of Weyerhaeus Steamship Co. The presentation w made on behalf of President Roo velt by Captain Milton E. Crossma U.S.M.S., superintendent of the M itime Service Officers School, A meda, California. The award, t highest a merchant seaman can ceive, was given for extraordina bravery and devotion to duty dur a series of devastating air attacks merchant vessels in Port Darwin, the start of the war.





At left (l. to r.): Lt. Comdr. Frank C. Krastin, U.S.M.S.; Bert How Tide Water Associated Oil Co.; Capt. Roy Janes, tanker co-ordinator, W.S.A. office.

Below (l. to r.): Stanley Hiller, Hillcone Steamship Co.; Com William G. Terwilliger, U.S.N.R.; John Davidson, American-Hawa Steamship Co.; Eugene Hoffman, secretary, Propeller Club.



FORWARD THRUSTING PROPELLERS!

These "spark plugs" of the Port of San Francisco, Propeller Club of the United States, comprise the now famous 1944 House Committee, which under the leadership of Carroll Reeves, arranged programs and many colorful events attracting record-breaking attendances. Climactic program of the year was staged on December 27, with top executives of the Coast's steamship lines on deck. (Pictures in our February issue.)

The event pictured in this scoop photo was pre-Christmas luncheon hosted by Fred Doelker, the Club's able helmsman.

Left to right (standing): Ed J. Schneider, B. H. Parkinson, W. Edgar Martin, J. P. McArthur, H. H. Piersan, D. N. Lillevand, Captain Henry Blackstone. (Seated) left to right: Clyde F. Williamsan, John Davidsan, Robert D. Spear, R. P. Hasenauer, R. De Gorog, Fred L. Doelker, Carroll F. Reeves, Ramand F. Burley, Eugene F. Hoffman, B. N. De Rachie, Edward H. Harms, and B. O. Pickard.

S. F. Propellers Slate for '45

Annual election of officers to direct the activities in 1945 of the Port of San Francisco, Propeller Club of the United States, will take place on January 17.

The nominating committee, comprising Frazer A. Bailey, chairman, W. J. Bush, John T. Greany, Sr., Marshall Levis and Earl Livingston, announce the following slate:

President, Joseph A. Moore, Jr., to succeed Fred L. Doelker: Joseph J. Geary, first vice president; John Davidson, second vice president; W. Miller Laughton, third vice president; Eugene F. Hoffman, secretary-treasurer.

The following are nominated for a one-year term as Governors: Fred L. Doelker, Joseph A. Moore, Jr., B. O. Pickard, Charles L. Wheeler, A. B. Poole. Two-year term: Hugh Gallagher, Carroll Reeves, Joseph J. Geary, E. P. Crossan, W. Edgar Martin. Three-year term: Dearborn Clark, J. J. Coney, Gregory Harrison, W. Miller Laughton.

New Port Engineer—Ed. T. Senter, marine superintendent of the Grace Line for Pacific Coast ports announces the transfer of **A. E. Wion,** now assistant port engineer in San Francisco, to Los Angeles, as port engineer located at San Pedro.

Several key officials of the Alaska Steamship Co., marine superintendent's staff, were associated with the Grace Line office preparatory to the opening of the former company's new office on December 1, at 417 Market Street, San Francisco. These officials are G. S. Duryea, district superintendent; Capt. William Henshaw, district port captain; Joseph McNulty, port engineer; and Edward Tichy, district purchasing agent.



RETURNS FROM EASTERN YISIT

Tam Bannan, executive vice president of Western Gear Works of Seattle, Wash., with its plants in Lynwood, Vernon and San Francisco, Calif., visited Southern California plants recently on his way back to Seattle, following a trip to the East Coast. He is optimistic about the future of West Coast industry.



Scene at the dinner held at the Bohemian Club, San Francisco, when Harry S. Scott and Fred L. Doelker received the Royal Order of Vasa, First Class, from the King of Sweden, through Consul General C. E. Wollerstedt.

KING OF SWEDEN HONORS TWO COAST STEAMSHIP EXECUTIVES

For more than a quarter of a century two Pacific Coast steamship officials have been the means of building up trade relations between Sweden and the United States. In recognition of this, the King of Sweden recently bestowed the Royal Order of Vasa, First Class, on Harry S. Scott, president, General Steamship Corp., Ltd., and on Fred L. Doelker, manager, W. R. Grace & Co.



Harry S. Scott, president, General Steamship Corporation, Ltd.

Consul General C. E. Wallerstedt made the presentation on behalf of his government in the presence of a distinguished gathering in the Bohemian Club in San Francisco, following a dinner. While conferring the honor, he called attention to the fact that Sweden has been a trading nation for centuries, and that their huge import and export business maintained annually with the United States holds bright promises for heavy expansion after the war.

The Royal Order of Vasa, First Class, is given as a merit of award to those performing outstanding service in fields of agriculture, mining, art, commerce, industry, for writing in these fields and for well performed public service.

The General Steamship Corporation has represented the Trans-Atlantic Steamship Company, Ltd., of Gothenburg, Sweden, on the Pacific Coast since December 10, 1921. During this period the company has managed the activities of the Australia Direct Line which has been in continuous operation with fast Swedish Flagships between America's West Coast ports and the Antipodes.

W. R. Grace & Company have represented the Johnson Line since July 23, 1914, as General Agents, when this company started service out of Swedish ports to the Canal-Central American ports, Mexico and the Pacific Coast, including British Columbia.



Fred L. Doelker, manager, W. R. Grace and Co.





Top (l. to r.): E. A. Johnson, Deconhil Shipping Co.; H. J. Wrigley, Weyerhaeuser Steamship Co.; J. J. Gronville, Deconhil Shipping Co.; Bill Rudy, Xzit Sales Co.; P. E. Odeen, Alcoa Steamship Co., Inc; Joe Costello, J. M. Costello Supply Co.; Frank T. McGrath, ottorney.

SMOOTH STEAMING CHARTED FOR '45!

An informal gathering of San Francisco men who keep the big ships steaming out of Coast ports was held at the Palace Hotel during early December, when W. H. "Bill" Rudy of Xzit sales organization and "Joe" Costello, of J. M. Costello Supply Co., who represents Xzit, were hosts to the maritimers pictured in these candid views.

Bill and Joe, up for a few days from their "Pedro" - Wilmington stamping grounds, reported that The Propeller Club and Bilge Club are going strong with big holiday plans.

The many friends of John Cordes will be glad to see him looking so rugged, hale and hearty, as he appears in one of our illustrations. Nice to have John on deck again!



Upper right (l. to r.): J. F. Johnson, chief surveyor Matson Navigation Co.; W. R. Muir, Cordes Bros.; Frank De Pue, United Engineering Co., Ltd.



Right (l. to r.): Capt. Tom White, Weyerhaeuser Steamship Co.; J. C. Winters, Oliver J. Olson & Co.; Bob Young, Cordes Bros.; Walter Spring, Weyerhaeuser Steamship Co.

Lower right (l. to r.): E. L. Harris, Alcoa Steamship Co., Inc.; A. C. McChesney, city official; G. L. Olson, Oliver J. Olson Co.



Lower left (l. to r.): George W. Curron, Los Angeles Tanker Operators, Inc.; Joe Costello, J. M. Costello Supply Co.; M. C. Wright, Deconhil Shipping Co.





W. M. Loughton Now General Manager

Effective December 1, Mr. Laughton was made general manager of Bethlehem Steel Company's Shipbuilding Division, San Francisco and Alameda yards.

He has been with Bethlehem far over 20 years, starting as machinist's helper at Sparrows Point, Md. After serving in various capacities on the East Coast, he was transferred in 1936 to San Francisco, where he has held important executive positions prior to his appointment in February, 1944, as manager of San Francisco yard and general manager of Bethlehem-Alameda yard.

Added to Staff

Because war's demands for steampower have mounted throughout Canada, Edward Stanley D'Arcy, Winnipeg and Manitoba chemist, has just been appointed to the staff of the Dominion Flow Meter Company, Ltd., Toronto, and has undergone a two weeks' intensive course in boiler water conditioning technique and



Edward Stanley D'Arcy of Dominion Flow Meter Co. Ltd.

automatic combustion control at the Pittsburgh home office of Hagan Corporation and Hall Laboratories.

Boiler water conditioning procedure practiced by the Dominion Flow Meter Company is based on researches by Dr. R. E. Hall, former U. S. Bureau of Mines chemist, who found, over twenty years ago, the cause of scale and corrosion in boilers and offered a preventive treatment based on the use of a chemical which had remained a laboratory curiosity for more than 100 years.

The Alaska Steamship Company and the Northland Transportation Company, general agents for the War Shipping Administration, have opened their own District Office in San Francisco.

The administrative staff is composed of G. S. Duryea as district superintendent; Captain W. W. Henshaw as port captain; John McNulty as port engineer, and E. J. Tichey, purchasing agent.

The announcement was issued jointly by L. W. Baker, vice president and general manager, Alaska Steamship Company, and William Semar, manager of the Northland Transportation Company.

Muir Joins Cordes Bros.

William R. Muir has recovered from his recent illness and joined the staff of Cordes Bros., consulting engineers, San Francisco, who represent the Leslie Co., Sandusky Foundry and Machine Co., Saverite Engineering Co. and Selby Battersby Co.

Bill is an ex-chief engineer with many years' service afloat and ashore and had retired from the staff of port engineer of the Standard Oil Company of California, after 35 years service. At the outbreak of war he returned from retirement to assist in the war effort as assistant port engineer for the Pacific Tankers Inc.

His many friends will be pleased to hear of his recovery and wish him well in his new association.

William R. Muir



Shoreside Personalities

Commander M. Ralph Sheaf, USNR, one of the best known officers in Pacific shipping, left his post early in December as superintendent of the U. S. Marine Cadet Basic School at San Mateo to assume a new post on the East Coast.

Under direction of Commander Sheaf, the Maritime Academy at San Mateo was built. Under his supervision, thousands of youths were trained in the early emergency for merchant ships. His achievements in completing the school ahead of schedule and his cadet training system won for him commendation of Navy and Maritime executives as well as compliments of steamship operators and merchant skippers.

Succeeding Commander Sheaf is Commander Arthur O. Brady, formerly with the Merchant Marine Cadet Corps in Washington, and prior to that an officer on board ships of the U. S. Lines, and the American-Hawaiian Steamship Co.

J. Paul Thompson, on November 17, became manager of Construction and Repair Maintenance of Matson Company, San Francisco.

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Save your time (maybe temper, too!) by going direct to the *one source* which has everything you need—your Tube Turns distributor. He handles the most complete line—which includes more than 4,000 different kinds and sizes of welding fittings and flanges!

Your Tube Turns distributor is a stocking distributor—which means that the particular fittings you need are most probably right *there* for spot delivery. He is a pipe and fitting specialist in his own right—ready, willing, and able to help you solve difficult problems.

And, through the Tube Turns branch offices and plant, his service is backed by the nation's finest group of welding fitting engineers—the men who originated seamless welding fittings. Tube-Turn seamless welding fittings were the first—and are still the best.



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Right: These two USMS seamen seem rother wrapped up in pulchritude.

USMS Canteen Opens for Christmas

Five days before Christmas, canteen doors at the U. S. Maritime Service Center at 1000 Geary Street, San Francisco, opened to the boys in the maritime service. Officiating as hostesses at the canteen are the Women's Organization for the American Merchant Marine, who held open house there the night before the official opening. Wall decorations of mischievous sea nymphs were designed by William Burke and painted by several members of the women's group which included: Mrs. Earle Carder, Mrs. Leonard Rummel, Mrs. Betty Long and Phyliss Colson.

This service center is the hub of USMS activities in the Bay area, with Captain H. J. Tiedemann, USMS, Pacific District Operations Officer for the USMS, at the helm. The men at the Center have received their basic training at the Apprentice Seamen base at Catalina Island, and are awaiting here call to merchant ships needing crews. They are bunked aboard the Center and called in rotation.

This canteen is the first of its kind opened exclusively to maritime service seamen in San Francisco, and the Women's Organization canteen volunteers have done and are doing a splendid service to the men who help to deliver the goods of war.

Top, left: Boys of the Maritime Service.

Second scene (l to r): Commander Henry V. Barbieri, Mrs. Barbieri, Commodore Philip Roach, Mrs. Roach, Mrs. G. W. Stedman, Jr., and Commander Stedman.

Third scene: Canteen Food Bar the night of open house.

At left: Candid view of nautical art and art committee responsible for seafaring beauties. (L to r): Mr. and Mrs. Leonard Rummel, Gene Du Pont, Phyliss Colsan, Mrs. Earle Carder, pres. of WOAMM, and Mrs. Betty Long, chairman of Canteen. Lt. Comdr. S. L. Potton, USMS, exec. officer of building, is commenting on their fine brush work.



TO SPEED THE SHIPS...

General Engineering Announces Newly Expanded Facilities .....

TO MEET the growing demands of war in the Pacific, General Engineering and Dry Dock Company is now completing an extensive expansion program, adding three graving docks, shops, and equipment to Geddco's Alameda facilities. By this addition, General Engineering becomes one of the largest repair yards on the Pacific Coast, with a full half-mile of waterfront on the Oakland Estuary, plus our dock and shop facilities in San Francisco.

General Engineering is ready to speed the ships to war, and to convert them when Victory is won.

GENERAL ENGINEERING
AND DRY DOCK COMPANY

SAN FRANCISCO • ALAMEDA

"M" PENNANT Awarded Submarine Signal Co.



Above: "M" pennant is proudly displayed at Submarine Signal Co., (l to r): Commissioner J. M. Carmody; H. J. W. Fay, president of Submarine Signal Co.; Hon. A. C. Murray, mayor of Fall River, Mass.; D. H. Harris, assistant to Mr. Fay, and Arnold M. Skudre, Fall River Manager.

Left: H. J. W. Fay, president Submarine Signal Co., congratulates employees and management for their achievement, at the Fall River Division of the firm.

(Photos courtesy Fall River Herald News)

Coast Guard Plaques Awarded At L. A. Joint Meet

At a joint meeting of the Bilge, Propeller and Rotary Clubs of Southern California, held at Long Beach, November 8, Charles Wright led the Pledge of Allegiance to the Flag; Admiral Marshall, the toast "To our Country, right or wrong . . ."; Rotary's President, Phil Swaffield, turned the meeting over to Chairman of the Day, Eloi Amar, member of all three clubs and head of the Long Beach Port Department.

During the session the United States Coast Guard awarded its Security Shield of Honor to the L. A. Steamship Assn., for its invaluable assistance in reducing fire and sabotage and for otherwise aiding in the safe and uninterrupted flow of fighting manpower and war materiel; and to the Waterfront Employers Assn., for its exceptional work in connection with explosives, their handling and identification.

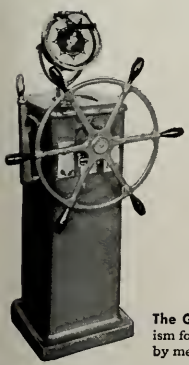
Scenes at joint meeting in Southern California, among the head table guests were: O. W. Pearson, v. p. of Marine Terminals Corp., L. A., and dir. of Waterfront Employers' Assn.; Comdr. Jonah Jones, head of USCG public relations; and other Coast Guard and Naval officials. At right, seated: R. W. Decker, dir. Bilge Club, pinch-hitting for Pres. T. W. Buchholz; (standing) Lee K. Vermille, pres. Propeller Club; Col. J. K. Herbert, C. O. of Los Angeles Port of Embarkation; Rev. James W. Brougher, Jr., Chaplain of Propeller Club and Pastor of First Baptist Church of Glendale; and Capt. W. F. Towle, dist. CG officer of 11th ND.







There is economy in this wake



The Gyro-Pilot control unit contains the mechanism for automatic steering, and for manual steering by means of the pilot wheel.

THE STRAIGHT-AS-A-DIE wake that Metal Mike leaves behind when he steers a ship is the sign of a Sperry Gyro-Pilot on the job.

Many hundreds of ships of all types —cargo, troop, tanker—are steering straighter courses toward the fighting fronts because of the Gyro-Pilots with which they are equipped.

Metal Mike applies only small rudder angles at the right split second—day in and day out. This means maximum economy.

Also, Metal Mike contributes to safety, by providing a complete electric telemotor system entirely independent of, and paralleling, the ship's hydraulic telemotor.

The watch officer on the bridge has, within easy reach, means for quickly changing from automatic steering to Gyro-Pilot hand steering or to the hydraulic telemotor.

For maximum economy, be sure to include the Sperry Gyro-Pilot in the specifications for your new ships.

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The late Alfred Scott Gunn, general manager of the Bethlehem Steel Company's shipbuilding division on the Pacific Coast and vice president of Bethlehem-Alameda Shipyard, Inc.

NECROLOGY

Al Gunn Passes

Alfred Scott Gunn, general manager of the Bethlehem Steel Company's shipbuilding division on the Pacific Coast, and vice president of Bethlehem-Alameda Shipyard, Inc., one of the most highly respected and best loved shipbuilding executives, died Thursday, November 30, at his home in Hillsborough, California.

For the past 17 years Mr. Gunn had headed Bethlehem's shipbuilding and ship repairing activities on the Coast. Prior to that, from 1915, he had been assistant general manager of the company's Coast shipyards under the late master shipbuilder, Jos. Tynan, and, as such, carried much responsibility for their operation. What was then known as the Union Iron Works, now Bethlehem's San Francisco shipyard, was the principal unit among the company's yards.

As a shipbuilding executive in both World War I and World War II, he played an important part in the great increase in shipbuilding and ship repair capacity and production made necessary by these emergencies. He had a leading part in the launching of 12 World War I vessels (8 destroyers and 4 cargo vessels) in a single day, on July 4, 1918. He had a hand in the directing of the tremendous amount of ship repair work accomplished soon after our entry into World War II.

Born in San Francisco in 1877, he began his career at the Union Iron Works in 1893 as an apprentice in steel shipfitting, advancing through the ranks until, in 1927, he was appointed to his last post.

Mr. Gunn was prominent in shipping circles, being a member of the Pacific Coast general committee for the American Bureau of Shipping and a member of the Society of Naval Architects and Marine Engineers. In addition, he was a member of The Family, Bohemian Club, Pacific-Union Club, San Francisco Golf Club, San Francisco Commercial Club, Mariners' Club, Propeller Club of the United States, and the Masonic Order.

Surviving are his widow and two children, Mrs. Dorothy Johnson of San Francisco and Alfred Scott Gunn, Jr., of Boston.

S. Willson Richards, senior consultant in the Division of Public Relations of the U. S. Maritime Commission and War Shipping Administration, died December 21.

Born at Ossining, New York on November 11, 1881, Mr. Richards had been associated with the Government maritime agencies since July 1943.

Prior to that date, Mr. Richards had been editor of the Marine News of New York. He was a member of the Society of Naval Architects and Marine Engineers and of the Propeller Club of the United States.

He is survived by his widow, two daughters, and a son now overseas with the Army.

Captain Melville J. Bulger, port captain for the Matson Navigation Company, passed away on December 22, at the age of 46 years.

Son of a distinguished father, the late John K. Bulger, U. S. Chief Inspector of Hulls and Boilers in this district for a quarter of a century and grandson of Captain Martin Bulger, one-time Pacific Mail skipper and pilot commissioner, his death was received with profound regret by hundreds of seafaring friends afloat and ashore. He was one of the most respected officials in Matson's organization.

He is survived by his widow and a sister.

Veteran U. S. shipping commissioner, Walter MacArthur, passed away on December 6, thus ending a long maritime career. Since 1933, Mr. MacArthur had been officially retired, yet he continued his interest in shipping up to the time of his death.

He was the author of many books on maritime practices and information and was editor of the Coast Seamen's Journal from 1891 to 1913. One of his best known books was the Handbook of Navigation Laws of the United States.

He served from 1913 to 1933 as Shipping Commissioner in the Port of San Francisco. Prior to that he had served in various capacities for the British and American governments.

John J. McGowman, traffic manager in San Francisco for the Isthmian Line, died suddenly in December of a heart attack. He was 64. He had served here for the last eight years, but previously had been stationed in Seattle. His entire business life was devoted to the shipping industry.



oare Dry Dock Company's blood donation con-st winner, Mrs. Agatha Bittman, steel checker, o obtained 299 blood donations in eight eks for the Red Cross. Mrs. Bittman won e sponsorship of a cargo vessel for her endid work.

ill His Boots or His Veins

Blood plasma donations—1851 of em—were netted in a contest con-ucted among Moore Dry Dock ompany employees in which 17 ndidates participated. The winner as awarded sponsorship of a C-2 rgo vessel launched on December h.

The contest was won by Mrs. gatha Bittman, steel checker, at the oore shipyard, who obtained the nation of 299 pints of blood for e Red Cross center. Mrs. Bittman the wife of a Navy construction ttalion chief shipfitter, stationed mewhere in the Pacific.

Utilizing the slogan, "If you can't l his boots, fill his veins," the con-st was conducted by the six Moore bor-Management Committees. The ive began September 11 and ended Armistice Day. Candidates were le to claim 100 votes for every rson they had persuaded to donate oint of blood. Votes for candidates re chalked up in Red Cross centers far away as England and Italy. ctures and information concerning e candidates were posted at both e San Francisco and Oakland Red oss depots.



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Post-War Sales Expansion For United States Plywood Corp.

A newly-formed California Sales Division of United States Plywood Corporation of New York, was announced by S. W. Antoville, vice president and sales director for the company, in line with the post-war sales expansion program.

In charge of the Los Angeles branch warehouse is Fred B. Smales, who has been with the concern 12 years in the sales division, during which time he managed several of its branches.

Appointed manager of the San Francisco distributing unit is Don L. Braley, a member of U. S. Plywood's sales staff for six years.

Don L. Kesselring, with the company several years in sales, has been appointed manager of the distributing unit at Oakland, located at 570 Third Street.

Industrial Relations Director

Donald R. Waugh, who has been serving as Director of Industrial Relations for Isolantite, Inc., of Belleville, N.J., manufacturers of electrical insulators, became personnel manager at the submarine shipyard of the Electric Boat Company on December 1.

Mr. Waugh will succeed Arthur D. Barnes of Reynolds Hill, Mystic Conn., who will return to his former position as assistant to O. Pomeroy Robinson, vice president of the company and general manager of the Groton plant. Mr. Barnes has served as personnel manager since March 4 1943.

A former newspaper man, Mr Waugh was born on July 18, 1900 He is married and has four children.

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econversion Pricing by O.P.A.

Moving swiftly to meet an expect- d onrush of applications from San rancisco bay area manufacturers for rices on new civilian goods, **Robert . Parks,** Office of Price Administra- on district director, recently an- ounced the establishment of a spe- ial unit to service the wide field of econversion pricing.

The creation of the unit, composed f experienced pricing specialists and ewly recruited trained analysts, fol- owed a series of conferences between Director Parks and leading indus-



ROBERT B. PARKS

ialists and labor spokesmen in the ay region. The deliberations re- ealed the need for speed in giving he go-ahead signal to civilian manu- acturing if the area is to enjoy an ven break with other sections of the ountry in the reconversion planning.

arsons Moves

The general offices of Harry W. arsons, Inc., organization moved on ovember 29 to larger quarters at 24 alifornia Street. The phone number the same, with its various trunk nes and a direct line will connect to eir Ship Repair and Service Depart- ents at 440 Bryant Street and yard Bay and Taylor Streets.

Now Convoy Commodore

Friends on the Pacific Coast have been advised that **Captain Thomas Blau,** famed Pacific Mail Steamship skipper of a quarter of a century ago, is now Convoy Commodore for the Navy, serving in Atlantic waters.

Shortly after the commencement of World War II, he was promoted from Commander in the Reserve to Captain in the Navy. He was formerly commandant of the U. S. Maritime Commission Service, but asked to be relieved in May 1943, to return to sea duty.

Captain Blau, in the last war while serving aboard the S.S. Mongolia as Chief Officer, had the distinction of being aboard the first American vessel to destroy an enemy submarine. He is holder of the Navy Cross and other decorations for sea valor. He is best remembered as having been skipper of the liner Colombia when this vessel sailed the Pacific. Captain Blau has served 50 years at sea.





A patient at Treasure Island Naval Hospital modeling a battle, which is one of the crafts taught by Red Cross volunteers of the Arts and Skills Corps as part of the Navy rehabilitation program.

Utah, Nevada, Idaho and Arizona. Approximately 1000 volunteer artists are enrolled in this branch and give much of their time and talent, with satisfying rewards.

There was, for instance, the boy back from the South Pacific who was apathetic toward the world, speaking little and smiling never. His improvement began the day one of these workers interested him in fing painting. Still another story is of serviceman in a West Coast hospit who will one day realize his life dream by attending one of the reco nized art institutes in the countr Financial limitations prevented h studying art, but while recuperatir from battle wounds he started pain ing under the guidance of a volu teer corps artist. Before his return active service he held a one-man sho which drew favorable comment fro the press in a nearby city, and whic brought him the offer of a scholarsh when his wartime duties are finishe

WOUNDED VETERANS Offered CREATIVE THERAPHY

Veterans of battles, whose hospitalization in Army and Navy general hospitals has run into weeks and months, or longer, have needed a specialized form of constructive recreation which would restore the feeling of self-respect which comes with creative work. The medical (Army and Navy) leaders felt that the minds of the men should be kept alive to patterns of work, and after conferring with the American Red Cross on this problem, Arts and Skills Corps came into being.

Mrs. Dorothy Wright Liebes of San Francisco, artist and textile designer of national prominence, was an enthusiastic leader in the formation of this newest of the 35 branches of service which the Red Cross offers. Only established, recognized artists and craftsmen are eligible for membership in the corps, and they teach the men, either in the hospital workshop or at the bedside, the skill of woodcarving, leather work, weaving, sketching and painting, jewelry making, ceramics, pottery work, fly-tying, knot tying, commercial art and lettering, and many other forms of art.

The Pacific Coast Area of the Red Cross has some 25 Arts and Skills Corps in operation in the States of Washington, Oregon, California,



A serviceman at a San Francisco hospital being taught weaving by an artist member. This work is carried on under the auspices of the Army Occupational Therapy Department.



Hospitalized servicemen find finger painting fascinating and produce useful wrapping paper and Chrisfmas cards.



At the Naval Hospital, Treasure Island, Califarnia, a bed patient is weaving a belt, another skill taught by Red Cross volunteers. ' This craft is most useful and helpful ta relieve the tedium of inactivity.



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Float ball prevents water from entering line. Internal screen of fine mesh and heavy external screen, provide protection against flame and clogging by paint or debris.

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In vertical strip, top: William de Back, Food Machinery Corp.; bottom: Robert E. Friend, pres. Diesel Engine Mfg. Assn.

In horizontal strip, left: Clarence F. Jensky heads turbine sales division, Joshua Hendy Iron Works. Right: A. C. Weigel, vice pres. Combustion Engineering Co., Inc., who was recently installed as president of American Welding Society.

Food Machinery Executive

William de Back, former vice president and general manager of Chisholm-Ryder Co., Niagara Falls, N.Y., has been named vice president and a member of the executive committee of Food Machinery Corporation, President Paul L. Davies of the corporation announced. Mr. de Back is an inventor-executive who has numerous patents assigned to the corporation for which he will work. He was a Food Machinery Corporation executive and engineer several years ago.

D.E.M.A.'s Meet in Cleveland

A round table discussion of problems facing the industry is the pattern around which the annual meeting of Diesel Engine Manufacturers' Association was built. The meeting was held December 6, in Cleveland, Ohio.

This was strictly a business session, according to Robert E. Friend, president of the association and head of Nordberg Mfg. Co., Milwaukee. The diesel engine makers aired the issue that confronts them now and which will arise at the end of the war.

A new activity of the association—that of watching state legislation that may affect diesel engine interests—was discussed by Harvey T. Hill, DEMA's executive director. Committees on public relations, traffic, insurance and education reported their progress.

D.E.M.A. Elects

At its annual meeting in Cleveland, the Diesel Engine Manufacturers Association elected Robert H. Morse, Jr., sales manager of Fairbanks, Morse, as Treasurer for the second continuous term; F. H. Kilberry, president of Atlas Imperial Diesel Engine Co., Oakland, Calif., as Vice President; and Charles G. Cox, vice president of Enterprise Diesel Engine Co., San Francisco, as a Director.

Hendy Appoints Jensky To Head Turbine Sales

Appointment of Clarence F. Jensky to head a newly created turbine sales division is announced by Wallace Johnson, general sales manager of the Joshua Hendy Iron Works, Sunnyvale, California.

Jensky has been actively engaged in steam-turbine design and engineering for many years, including 11 years with Westinghouse and eight years as chief engineer and general manager of the Murray Iron Works, Burlington, Iowa, manufacturer of steam turbines and boilers. He has recently returned from an assignment as advisory turbine engineer in Washington, D. C.



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Economical, goes 6 times further—holds anything carried in metal pipe except certain heavy acids—expands and contracts with pipe movement—joints easily taken apart—withstands deflection, sharp temperature changes, vibration and pressures—better than litharge and glycerine for all uses. X-Pando is more than just a pipe joint compound. It is an all-purpose industrial sealing agent.

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James M. Warfield, asst. general manager of California Shipbuilding Corporation.

CALSHIP'S

Recent Appointments

By appointments announced by John A. McCone, president, California Shipbuilding Corporation, effective December 1, **James M. Warfield,** who has been administrative manager of the shipyard on Terminal Island, became assistant general manager of Calship, with direct responsibility to McCone for the corporation's operations. Warfield also became chairman of the Calship operating committee.

Thomas P. Loach, who has been assistant administrative manager of the shipyard, became administrative manager and was appointed as a member of the operating committee.

McCone announced that **Jerome K. Doolan,** who has retired as general manager of the Corporation, has assumed the responsibility of vice president and general manager of Compania-Constructora Bechtel-McCone, S.A., in charge of all foreign operations. Doolan is a vice president of the California Shipbuilding Corporation.

John A. McCone is president of Bechtel-McCone Corporation, which designed the Calship yard. Bechtel-McCone Corporation engages in design and construction of oil refineries, chemical plants, power plants, industrial plants and other types of construction calling for services of highly trained technologists. The company's head office is in Los Angeles.

Below, left: Thomas P. Loach, administrative manager of the California Shipbuilding Corporation. Right: Jerome K. Doolan, vice president and general manager of Companio-Constructora Bechtel-McCone, S. A., and vice president of the California Shipbuilding Corporation.



Shipping Trade Notes

Gotham Instrument Co. of New York are pleased to announce the opening of a branch factory in San Francisco, under the management of Joseph Ruck.

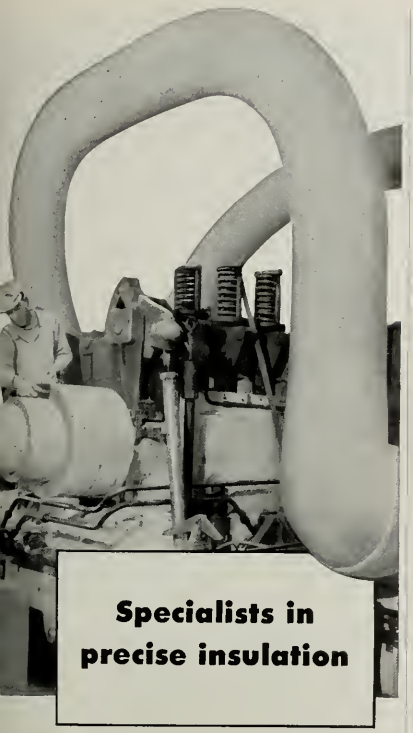
West Coast Rope Merger — Two leading names in the West's cordage industry, Portland Cordage Company of Portland and Seattle, and Tubbs Cordage Company, whose head office is in San Francisco, consolidated on January 1 under the name of Tubbs Cordage Company. This merger in no way affects the personnel of the various offices in Los Angeles, San Francisco, Portland, Seattle, Chicago and New York, nor will there be any change in the distributor set-up.

Whiting Corporation, Harvey, Illinois, announces appointment of Mullaney & Campbell, 539 Central Bldg., Seattle 4, Wash., as its exclusive sales representative in the Seattle territory. They will handle the sales of Whiting Cranes, foundry equipment, railroad equipment and aviation handling and maintenance equipment.

Erich Marx, consulting engineer specializing in design, product engineering and tooling for plastics in electrical and mechanical applications and special developments, has moved his office to 3424 West Eighth Street Los Angeles 5, California.

Ets-Hokin and Galvan, San Francisco, marine electrical engineers, contractors and equipment jobbers, have been appointed as California distributors of Stewart-Warner marine accessories. The addition of this line brings to Ets-Hokin and Galvan another well-known producer of electrical equipment, including marine instrument panels, tachometers and gages, electrical fuel panels and tachometer drive equipment.

Sperry has opened a Baltimore office because of the greatly increased demands coming from that area. The new office of Sperry Gyroscope Company in in the Snow Building, Room 505, 31 South Calvert Street, with Erik Duffy placed at the helm.



Specialists in precise insulation

36 years experience, the use of highest grade materials, craftsmanship in application... these are the qualities which have made Western Asbestos Co. a leading choice in the insulation field. Back of these qualities of our own organization is the research and experience of Johns-Manville... 85 years of it... in every conceivable type of insulation work. These are a few of the reasons why Western Asbestos can offer a Marine insulation service that combines utmost speed, precision and economy ..a service that also includes maintenance and emergency repairs.

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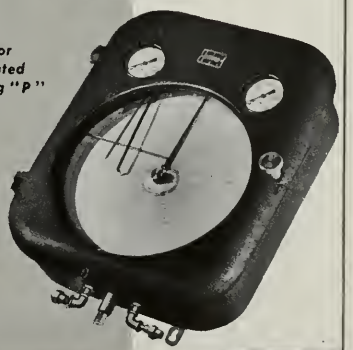


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REPAIRS TO SEA-GOING VESSELS
MACHINERY INSTALLATIONS
MANUFACTURERS OF ALL TYPES OF BEARINGS

Bethlehem Acquires Pacific Coast Forge. On December 1 the Pacific Coast Forge Company of Seattle was acquired by Bethlehem Steel Company.

The acquisition of this plant, which is adjacent to Bethlehem's steel plant in Seattle, rounds out the company's bolt and nut-making facilities on the Pacific Coast, as the company now operates similar plants adjacent to the South San Francisco steel plant and to the steel plant in Los Angeles.

Equipment Firms Merge—Merger of two well known Oakland marine and industrial specialty firms occurred recently with the establishment of the Rucker-Vaughn Company. The new concern is a result of the consolidation of the Vaughn-G. E. Witt Co., and the Rucker Equipment Co. Headquarters at 300-17th Street in Oakland and the factory is in Emeryville. Co-partners of the company are Clark E. Rucker, in charge of sales, and Clifford S. Vaughn in charge of production.

Groves Acquires Manning—Frank Groves, general manager of the Frank Groves Company, San Francisco, announces that his company recently purchased the Manning Packing & Supply Co., Inc. of Portland, Oregon.

The merchandise stock of Manning has been moved to the Frank Groves Company warehouse in Portland, and business is now operating as Manning Packing & Supply Co., Division of Frank Groves Company

New Parts for Sale

Removed from a 2000 HP Fairbanks Morse marine engine Model 33E16

1—#1422A Timken Thrust Bearing Type KE
1—#3066B Oil Throw Ring ot Thrust Bearing
1—#1789 Thrust Bearing Housing Cover
1—#1420 Thrust Bearing Housing
1—#3067 Oil Throw Guard
1—Stub Shaft with Flywheel, coupling and barring device
10—#3697 A-C Compression Relief Valves
2—D225E Exhaust Manifolds
1—#28D Cam Gear & Plate, complete
1—Woodward Governor type S-1, Serial #17496
1—Pilothouse Engine Control Stand

City Water, Light and Power Dept.
Municipal Utility Board
Jacksonville, Illinois



Symbolizing the accident-free record, at Moore Dry Dock's Oakland Yard, in construction of the SS Sparkling Wave, welders Judy Johnson (L) and Rachel Flores (R), string up "Old Man Accident."

A Great Safety Record

Topping an achievement earlier hailed as a world record, Moore Dry Dock Company workers on December 15 launched a second C-2 cargo vessel, the S.S. Sparkling Wave, after 48 accident-free working days on the building way. Safety-minded workers on the same shipway had previously built the S.S. Wild Wave, launched October 20, with no accidents during construction.

Chief Safety Engineer Wallace Terry of the Moore plant declared at the 11:20 a.m. launching that shipbuilders on the record-breaking shipway had worked over 570,000 manhours without incurring an injury resulting in time off the job.



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Our compliments to the men of the Merchant Marine.

We are proud that the ships they man are equipped with Jamison Cold Storage Doors.

Uncle Sam's fleets are now getting the best that our 50 years' experience can provide.

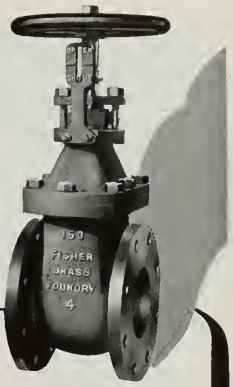
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"Fisher Is Meeting Delivery Dates"

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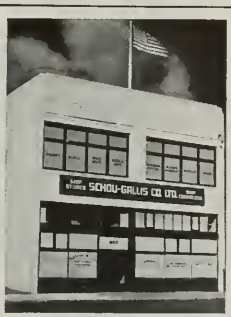
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Enterprise Auxiliary Engine Output

In the office of C. G. Cox, vice president and general manager of the Enterprise Engine and Foundry Company, San Francisco, there is a sales chart which with other statistics has a column projecting the total horsepower represented in installations of auxiliary diesel engines under the Maritime Commission cargo-carrying motorship program. The other day there was occasion for jubilation among Enterprise officials and employees when chart tabulations revealed the record total output of 150,000 horsepower in this classification. This impressive figure represents installations principally in motorships of the standard C1-A and C1-M-AV1 designs.

Balancer of Seamen Supply—Selection of seamen from the Atlantic for transfer to the increasingly important Pacific run will be one of the new duties assumed by James N. Pertess, War Shipping Administration executive of San Francisco, who has just been appointed to the port of New York.

Seattle Marine Museum—Leaders in Seattle shipping circles are urging that a marine museum be established in a downtown building or on the Seattle waterfront where ship models, ship pictures and equipment from famous ships that sailed the Puget Sound and Pacific Ocean trade routes years ago would be on display.

Such an institution was formed several years ago and was set up aboard the old sailing ship St. Paul, and was maintained by the Puget Sound Academy of Science.

Sold by the Foss Company, the St. Paul was towed to British Columbia where she was filled with rocks and converted into a breakwater, leaving the marine museum project abandoned. Now shipping men are urging that a permanent maritime exhibit be established and some of its sponsors have gone so far as to suggest that a building to house the exhibit be specially constructed on the Seattle waterfront.

The WSA announces that a total of $428,731 was expended on the Matson liner Matsonia, to fit her for Navy specifications as a troopship. The Matsonia is the former Malolo, first luxury liner built by Matson for their Hawaiian service. She was for many years commanded by Captain Frank Johnson, now shoreside with the company.

Some Recent Awards

Condenser Service & Engineering Co., Inc., Scranton, Pa., plant recently was awarded another star to the Maritime "M" pennant. Fitting ceremonies were held at the plant.

The Clyde Iron Works, Inc., Duluth, Minn., manufacturers of shipyard whirleys, deck machinery, material handling and construction equipment, received a letter from C. C. Bloch, Admiral, USN (Ret.), chairman of Navy Board for Production Awards, stating that they had been awarded a fourth star to the Army-Navy "E" pennant, due to the untiring efforts of the men and women of the plant to produce the equipment needed for victory.

Macwhyte Wire Rope Company of Kenosha, Wis., received its third Army-Navy "E" award in October. This addition signified their ability to continually merit the confidence of the War and Navy Departments.

Ajax Iron Works, Corry, Pa., was honored when the U. S. Maritime Commission awarded them the Maritime "M" pennant and Victory Fleet flag for their production of marine steam engines for coastal cargo vessels.

Dravo Corporation, Wilmington, Del., plant this fall was presented with the National Safety Council "S" flag for outstanding achievement in plant safety and accident reduction.

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Type 1.....12 quart
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GARBAGE PAILS
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28 gauge galvanized steel —termed medium weight 10 gallon capacity. Write for Bulletin No. 10.



GARBAGE CAN
... Nestable Type

28 gauge galvanized steel termed medium weight 20 gallon capacity. Write for Bulletin No. 22.

WASH TUBS...
Galvanized Steel

15 gallon capacity. Medium and heavy weight styles. Write for Bulletin No. 38.



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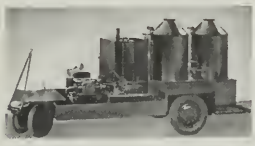
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U. S. Maritime Commission Shipbuilding Program — 1945-46

Yard	Tankers	C2's	Liberties	Victories	C3's	C1-M-AV1's	Total
Consolidated Steel		16					16
Calship				16			16
Marinship	9						9
Oregonship				25			25
Swan Island	17						17
West Coast Total	26	16		41			83
Bethlehem-Fairfield				20			20
Bethlehem-Sparrows					2		2
New England Shipbuilding			12				12
North Carolina Shipbuilding		15					15
South Eastern Shipbuilding						14	14
Sun Shipbuilding	20				3		23
Welding Shipyards, Inc.	2						2
East Coast Total	22	15	12	20	5	14	88
Alabama Shipbuilding Co.	12						12
Gulf Shipbuilding		1					1
J. A. Jones Shipbuilding (Fla.)			12				12
J. A. Jones (Ga.)						14	14
Ingalls Shipbuilding					4		4
Pennsylvania Shipbuilding						12	12
Gulf Coast Total	12	1	12		4	26	55
GRAND TOTAL	60	32	24	61	9	40	226

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THE GARLOCK PACKING CO.
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Shoreside News

Claude Knudsen, formerly chief engineer aboard the old Oceanic liners Sonoma, Ventura and Sierra and later head of Matson Navigation Company's newer liners Monterey, Lurline and Matsonia, is now superintendent-engineer with the General Engineering & Drydock Co's Alameda yards.

Perry Newcomb Passes

Perry Newcomb, district manager of Barber Steamship Lines in Los Angeles (American - West African Lines), died on November 24, after suffering for several years with a heart ailment. He was a member of the board of governors of the Propeller Club, and past president of the Los Angeles Steamship Association.



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From canvas to steam... from steam to wings... Matson stands for the evolution of transportation. From Mainland to Islands, Matson stands for the evolution of friendship. For sixty-two years, Matson has not been contented in promoting only travel and trade, but has sought even more to advance human relationships. And, when its war work is over, it will return once more to its accustomed task of providing the most modern modes of transportation... of being the servant of unity in the Pacific and the champion of closer understanding between Islands and Mainland.

Whatever the means... planes or ships... the cementing of friendship will be the key purpose of Matson.

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No Rejections Under Government Tests
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ADHESIVE CEMENTS AND SEALERS FOR FIBERGLAS INSULATION, CORK BOARD AND OTHER INSULATING PRODUCTS

INCO N-1 CEMENT for securing insulation board to bare metal surfaces.

INCO N-2 CEMENT for bonding tape or cloth to insulating board seams.

INCO N-3 SEALER PUTTY for sealing edges and beveling of exposed edges on bonded Fiberglas or similar type insulation generally used in pipe and duct work.

INCO N-4 SIZING SEALER as a fireproof coating on above materials.

Complying with requirements of Navy Specifications

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THE LAUNCHING PARTY OF MRS. AUSTIN W. SPERRY

Scene at Moore Dry Dock Co. Oakland yard when the SS Golden Racer was christened. (Left to right): J. G. Waggoner, Crane Co., L. A.; M. J. Burress, Crane mgr, S. F. branch; Mrs. Elliott, F. F. Elliatt, dist. mgr, Crane Co. of Seven Western States; Mrs. Sperry; J. C. Shelden, Crane mgr of Oakland; Mrs. Shelden; Mrs. Burress; and A. W. Zerrn, asst. mgr, S. F. branch.

New Marine Sections

J. C. Rengel and T. P. Eldridge have been appointed to manage special sections of the Marine Department of the Westinghouse Electric and Manufacturing Company, it has been announced by Charles H. Weaver, manager of that department.

Mr. Rengel is to manage a newly formed Navy Section of the department which will be responsible for sale of marine equipment to the U. S. Navy, the U. S. Coast Guard and for all shore establishment business, both from the Navy and private shipyards. Mr. Eldridge will manage a newly formed Merchant Marine Section which will be responsible for all business with the U. S. Maritime Commission, ship operating companies, U. S. Army Transportation Corps and for ship conversions and repairs.

TECHNICAL MODEL SERVICE

HALF MODELS . . . For the men who lay out the ship's plating.

STRUCTURAL MODELS . . . For analysis and solving problems of prefabrication.

STRUCTURAL SECTIONS . . . For visual training of personnel new to shipyard work.

LARGE SCALE MODELS . . . Fully detailed, decorated models, showing the completed ship from stem to stern, keel to topmast. A tangible record of shipyard achievement and an inspiration for all shipyard personnel.

VAN RYPER • VINEYARD HAVEN • MASSACHUSETTS



David Arnott, vice president and chief surveyor, American Bureau of Shipping. *(Photo courtesy Blackstone Studios)*

A.B.S. Chief on Coost

David Arnott, vice president and chief surveyor, American Bureau of Shipping, recently made a three weeks tour of the Pacific Coast, accompanied by Mrs. Arnott. This trip was an annual inspection tour of Pacific Coast offices of the Bureau, combined with a little vacation. One week was devoted to the Pacific Northwest, one week to San Francisco.

SUPER TROOP CARRIER!



Official U.S. Navy Photos



This class of Navy Transports has firepower—but depends as well on speed and the reliability of auxiliary deck machinery for protection!

To *insure* efficient performance, *all* transports of this type are equipped with rugged, modern LIDGERWOOD steering gears and windlasses. For over 71 years, on both merchant and naval vessels, LIDGERWOOD equipment has earned a proud reputation for efficiency and for long, reliable service.

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EVERYWHERE

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SEATTLE PORTLAND LOS ANGELES HONOLULU WILMINGTON



Crowd of several thousand employees and guests at Army-Navy "E" award ceremony at Associated Shipbuilders, Seattle.

Rear Admiral R. M. Griffin and H. W. McCurdy, president of Puget Sound Bridge & Dredging Co., display the award pennant.

Associated Wins Army-Navy "E"

The management and six thousand employees of Associated Shipbuilders, a subdivision of the Puget Sound Bridge and Dredging Co., were honored in November with the awarding of the Army-Navy "E" pennant. The award was made by Rear Admiral R. M. Griffin, commandant of the Puget Sound Navy Yard at Bremerton.

In making the award Admiral Griffin pointed out that "you build seaplane tenders, without which the dramatic work of the fleet scouting aircraft would be impractical. Yes, the ships that you have built are a vital part of our offensive. Although recent news has been encouraging, however, be not deluded into believing that the war is won. Its most difficult phase is just beginning.

"Six months from now your right to retain this award, which has been won by only three per cent of the war plants in the nation, will be challenged. Realizing, as I am sure you do, the big job that remains to be done, I am confident that this honor will be yours not only to have but also to hold."

Other speakers on the program, of which Seattle's Mayor William F. Devin was master of ceremonies, included Governor Arthur B. Langlie; Brigadier Ely P. Denson, commanding officer of the Seattle Port of Embarkation; Rear Admiral S. A. Taffinder, commandant of the 13th Naval District; Captain H. N. Wallin, supervisor of shipbuilding at Seattle, and Sam Downey, swingshift employee representative who accepted the award in behalf of the employees, delivered an inspiring address urging his fellow employees on to even greater achievement.

The awarding of the pennant was accepted by H. W. McCurdy, president of Puget Sound Bridge and Dredging Co.

In accepting the award Mr. McCurdy declared "we have labored earnestly and long to earn this recognition; undoubtedly that is why the realization is doubly sweet. From this plant, during the past 12 months, we have delivered 32 vessels to the Navy —an over-all average of one completed ship each eleven and a half days. During the past quarter, ending October 1, we had delivered one completed ship each ten days."

Sharples Corporation, Philadelphia Pa., received its fourth star to the Army-Navy burgee. This plant is extensively engaged in the production of centrifuges used for the purification of lubricating and fuel oil in the marine and other fields. One important wartime activity has been the task of designing and making of centrifuges which have played a part in the production of blood-plasma and the new drug penicillin.



Laboratory and "On-the-Job" Testing Proves *Balco* Joints Are Better!

STRENGTH is the thing to look for in ball and socket joints. Design, materials, machining and workmanship should unite to give the utmost joint strength and efficiency.

BALCO ball and socket joints have been proved for 90° torsion breakdown in comparative tests by a leading laboratory. Actual service has confirmed the laboratory findings. We *know* Balco joints will stand up. We *know* they'll give *you* the service you have a right to expect. Check the features and see for yourself.

In case you're skeptical, we offer to send any bona fide engineer a free Balco Joint for his own comparative tests. Balco service is at your disposal at all times. Write us your requirements or send for our catalog now!

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36 ft. YMS Equipped with 300 lb. Danforth

erformance of Danforth Anchors during Florida hurricone described in personal letter by Navy officer on on AMC minesweeper:

"Thought you might be interested in learning that we rode rough the recent hurricane on a Donforth. She held remarkbly well and so far os we know we did not drag an inch. wo other AMCs which were not using your onchor had quite lot of trouble and one of them went aground. • The urricane hit us in the afternoon and lasted four hours with inds of 120 miles per hour at the peok. Several other ships round broke loose at the height of the storm and nearly all e ships except the YMSs dragged anchors considerably. Every YMS wos equipped with your anchor and not one of them had o bit of trouble. • The officer in chorge of the minesweep task unit here made several complimentary remorks obout the onchor yesterdoy and soid he hopes to have Danforth onchors for every minesweeper here ofter seeing what a greot job they did in the hurricane. • It wos quite an experience and a lot of fun."



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FRANK GROVES ANNUAL XMAS PARTY



Each year the Frank Graves Company of San Francisco entertains at a Christmas party for part engineers and purchasing officials of steamship companies, and their wives. Each year the party gets bigger and better. This year more than a hundred guests gathered at the El Jardin Restaurant on December 14 for this yuletide get-together. Insert: Frank Graves.

Hendy Announces Diesel Sales Unit

G. C. (Jerry) Rasey has bee named supervisor of the marine an stationary diesel division of the ger eral sales department at the Joshu Hendy Iron Works, Sunnyvale, Cal fornia, with **Lawrence H. Earle** an **Louis Kaiser** as his assistants.

Before joining the Hendy organiz tion, Rasey was West Coast repr sentative of the Murphy Diesel Com pany, Milwaukee, Wisconsin. Prio to that, he was sales manager for th Washington Iron Works, Seattl Washington; development and sal engineer for the Hercules Moto Corporation, Canton, O.; and chie power engineer for the Bucyrus-Er Company, Milwaukee, Wisconsin.

Earle was previously with th Diesel division of the National Sup ply Company, at the Philadelph plant. Before that he spent 15 year as eastern sales and service manag for the Buda Company of Harve Illinois.

Kaiser has spent the past year wit the Hendy turbine shops. He cam to the company after 23 years wit the Honolulu Iron Works, Honolul H., where he served as sales an service engineer.

)n the Ways

(Continuation)

aiser's Yard 3 Launches Troop Transport

The U.S.S. Adolphus W. Greely, C-4 type vessel, built under the pervision of the U. S. Maritime ommission, was launched in the aiser Yard 3 at Richmond on No- mber 5.

Mrs. Clarke E. Wayland, wife of e vice president of the Western sbestos Company, acted as sponsor r the ship. The matron of honor as Mrs. Wm. Correia, wife of the ief U. S. Maritime Commission in- ector at the No. 3 yard.

The Western Asbestos Company erate a fully equipped insulating ant at this yard and are respon- ble for the insulation on all ships uilt there.

The vessel was named for a U. S. rmy general who served in the nion Army throughout the Civil Var, and also in the war with Spain.



Sponsor's group at the launching of General A. W. Greely. (L to r): Mrs. William Correia, Mrs. Clarke E. Wayland, Miss Bernice Rogers.

He was known in this area for his efficient handling of the emergency arrangements during and after the San Francisco fire in 1906.

Moore's Production

Moore's Dry Dock Co. in Oakland are now engaged on the Maritime Commission contract for 83, C-2 vessels, 61 of which have already been delivered. They expect to deliver the remaining 22 vessels by July 1945, six of these being of the refrigerator type.

By the summer of 1945 the yards are expected to be occupied with repair work exclusively. The Navy Department has alloted two new floating dry docks to the company, one of 18,000 tons capacity and the other a floating concrete dock of 2500 tons capacity known as an A.R.D. type.

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Some Pacific Coast Launchings

(Continued from page 54)

MS Star Knot, cargo ship, launched November 28.

USS Elkhart, combat transport, launched December 5.

USS Fallon, combat transport, launched December 14.

Marinship Corporation, Sausalito, California:

Tanker, SS Baldwin Hills, launched November 19.

Tanker, SS Whittier Hills, launched November 27.

Tanker, SS McKittrick Hills, launched November 26.

Tanker, SS Newhall Hills, launched December 6.

Tanker, SS Rincon Hills, launched December 17.

North American Shipbuilding Corporation, Newport Beach, Calif.:

51′ Purse Seiner, Betty Ann, launched November 22.

62′ Tuna Boat, La Belle, launched December 4.

51′ Purse Seiner and Dragger, Pioneer, launched December 28.



Tanker SS Baldwin Hills, as she slides down the ways on November 19, from Marinship Corporation's Sausalito Yard.

Oregon Shipbuilding Corporation Portland, Oregon:

381st attack transport, SS Kir bury, launched November 16.

382nd attack transport, SS Lan launched November 19.

383rd attack transport, SS Lau dale, launched November 23.

384th attack transport, SS Lava launched November 27.

385th Victory, SS Longview V tory, launched November 30.

386th Victory, SS Lewiston V tory, launched December 2.

387th Victory, SS Minot Victo launched December 4.

388th Victory, SS Pierce Victo launched December 6.

389th Victory, SS Bozeman V tory, launched December 9.

390th Victory, SS Saginaw V tory, launched December 12.

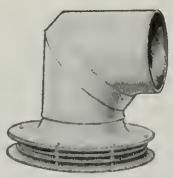
391st Victory, SS Coeur d'Ale Victory, launched December 15.

The Permanente Metals Corporati Yards One and Two, Richmond, California:

VC2-S-AP5 Victory troopsh USS Randall, launched November

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C2-S-AP2 Victory cargo ship, Lakewood Victory, launched November 17.

C2-S-AP5 Victory troopship, S Bingham, launched November

C2-S-AP2 Victory cargo vessel, Salina Victory, launched November 24.

C2-S-AP2 Victory cargo vessel, Anchorage Victory, launched November 28.

C2-S-AP2 Victory cargo vessel, Hastings Victory, launched November 30.

C2-S-AP2 Victory cargo vessel, Colorado Springs Victory, launched December 2.

C2-S-AP2 Victory cargo vessel, Muncie Victory, launched December 7.

C2-S-AP2 Victory cargo vessel, Elko Victory, launched December 8.

C2-S-AP2 Victory cargo vessel, Elgin Victory, launched December 12.

er Company, Inc.,
d Three:

4-S-A1 troop transport, USS General C. H. Muir, launched November 24.

C4-S-A1 troop transport, USS General Henry B. Freeman, launched December 11.

Kaiser Company, Inc.,
Yard Four:

C1-M-AV1 coastal cargo vessel, USS Brevard, launched November 18.

C1-M-AV1 coastal cargo vessel, USS Bullock, launched December 2.

Salvaging Russian Ship—A navy crew of 50 men is well along on the tedious task of salvaging a Russian freighter which sank several months ago at Portland, Ore.

The ship is being cut apart by underwater torches and removed piecemeal from the bottom of the Willamette river. Two large barges and cranes are being used, and eight divers are at work on the job.

Captain J. I. Tooker, one of the Navy's experts on salvage work, is in charge of operations.



At Marinship, Sir Clive Baillieu, deputy president of Federation of British Industries, had his first opportunity to meet an American shipyard woman worker. He is shown shaking hands with Margaret L. Payne, burner. Others are Bruce Vernon, chief engineer of yard; Frank Paretti, burner leadman; and K. K. Bechtel, pres. of Marinship. (Photo courtesy of Marinship.)

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Bethlehem Safety Record

Two years without a fatal accident, during the recent period of intensive activity in shipbuilding and ship repairing, is the outstanding record set up on November 18 by the San Francisco yard of Bethlehem Steel Company.

During these two years the total number of man-hours of "exposure to hazard" at the yard was over 81,000,000, equivalent to the time of 1000 men working for approximately 40 years.

A large part of the work at the yard during this time was done on ships for the U. S. Government where both speed and skilled craftsmanship were required. Keel layings and launchings during this period numbered 30 combat vessels, including cruisers, destroyers and destroyer escorts, while ship repairs were performed on 770 vitally needed vessels, both combat and merchant.

The rate of non-fatal accidents during the two years has been reduced 49.4 per cent, or expressed in another way, the prevention of these accidents can be said to have saved over 200,000 man-hours for essential production.

Safety practices in the San Francisco yard have been carried on for many years, and recognition of this work was made by the National Safety Council on July 3 when the Distinguished Service to Safety Award with the "S" pennant, the highest honor granted by this national organization, was made to the yard. Recognition also has been made by the Industrial Accident Prevention Bureau of the Industrial Accident Commission of California and the California Federation of Business and Professional Women's Clubs.

YOUR PROBLEMS ANSWERED

(Continued from page 45)

placing the gear in condition to ge under way.

Handwheels 62 should be checke and set 75 per cent to 90 per cent for standard operation. When 2 only Ram cylinders are in operation, stroke should be set at 60 per cent or 65 pe cent.

After starting either one of the motors (or both) the corresponding lever (or levers) can be moved to the "operate" position, thus placing the steering gear ready to answer the steering wheel.

Caution: These instructions ar for the steering gear which is diagrammed in our illustration (the Stet son-Ross gear). Every operating en gineer should have the manufactur er's instruction book covering the maintenance and operation of the particular gear with which his ship i equipped.

Pacific MARINE REVIEW



FEBRUARY, 1945

PHOTO: COURTESY BETHLEHEM STEEL

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Pacific MARINE REVIEW

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NEXT MONTH!

...s Coast Share in Naval Building
An illustrated feature, showing the tremendo tonnage and number of auxiliary and combat ships for the U. S. Navy, built by Pacific Coast shipyards.

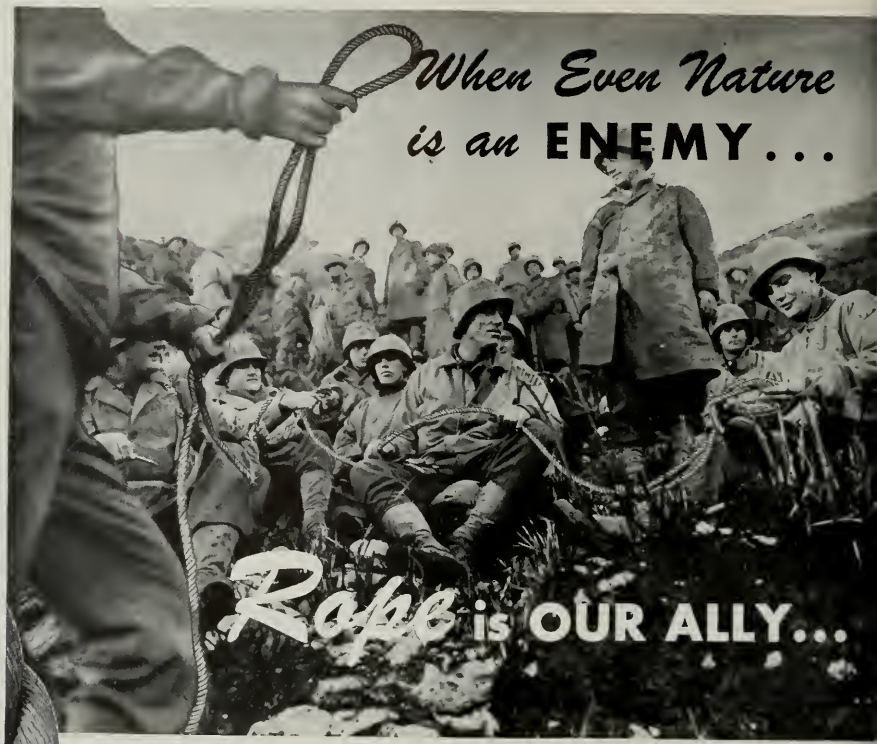
...rancisco's Post-War Port
An outline of the proposed post-war improvements to the famed Embarcadero.

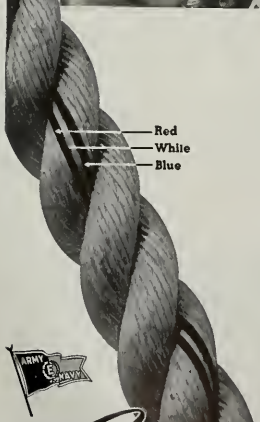
...al is of U.S.M.C. Contracts for 1945
The Maritime Commission is now letting contracts on lump-sum basis.

PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11

Offices in: NEW YORK CITY . . . . 16 West 46 Street, Telephone BRyant 9-8436
LOS ANGELES . . 816 West 5th Street, 13. Telephone MIchigan 3129

Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.





● Next time you wonder why you can't get all the good Columbian Rope you want—remember this picture. These men, officers and non-coms, are studying the use of Rope in a Mountain Training Sector in Italy. When a desperate enemy builds his strategy around the terrain—hides behind mountains that even mules can't climb—our fighters must still get through—inexorably driving the enemy from one more secret place of hiding. And, when that happens, only Rope will get them through. These men will instruct their commands in the use of Rope. And, lashed together, they will slowly, certainly, climb the highest peaks; painfully make their way into the deepest chasms—fighting for every inch of ground they gain.

When these fellows no longer need Rope to lash each to the other in a shell-torn Hell of War—then, Columbian Rope will be available to you. They need the best now—but, as always, the best is worth waiting for.

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Columbian ROPE IS A SINEW OF WAR

American Merchant Marine

Pacific MARINE REVIEW

According to Maritime Commission estimates our merchant marine, at the close of this war, may total 60 million total d.w. capacity. The ships composing this grand total in approximate round numbers will be: 2500 Liberty class ships; 600 large tankers; 500 Victory class ships; 800 Maritime Commission standard C type, cargo liners, cargo-passenger liners, and reefers; 500 smaller Maritime Commission coastal cargo vessels, tankers and special designs; and some 850 over-age cargo vessels, tankers, and passenger cargo liners.

Of the various categories listed above many have been converted into or built as military types. Many of the Victory class, a considerable number of the Liberty class, and a very large percentage of the Maritime Commission standard C type have been so converted. It seems now to be the opinion of practical naval architects and marine engineers that it would be commercially uneconomical to reconvert many of these military type ships. This for two reasons: (1) The great cost of conversion; (2) The fact that in many cases the reconverted vessel cannot be made to fill exactly the special requirements of the trade.

It would therefore appear that while we will have a total tonnage capacity far in excess of our normal use we will have an actual shortage in the types that best suit our commercial needs. The surplus, if any, lies in the Liberty type, the Victory type, the smaller coastal cargo vessels, and the over-age cargo carriers. There will probably be a positive shortage in the modern fast cargo and cargo passenger liner types.

The Liberty type vessel was built solely for war purposes. This type has an average speed of around 10 knots. Her propulsion machinery is uneconomical in fuel consumption. She is not fitted to be successful in commercial competition in any cargo liner trade. Her hull is comparitively light, and we understand that on commercial standards she gets a five-year classification rating. In many ways this type of ship and power plant is good for tramp trades. The tramp ship operators of the world will be practically without tonnage at the end of the war and will probably be faced with the highest freight rates they have ever enjoyed. They will therefore be willing and able to pay large cash prices for tonnage ready to go to sea. This is America's opportunity to sell a large part of her surplus Liberty type vessels at a good price and also by that sale to put somewhat of a brake on inflation in shipbuilding prices.

We do not think that the Liberty type of vessel should be laid up in large numbers for future emergencies. We think that the surplus of this type of ship should be treated like any other surplus and sold on the world's markets. That part of the Liberty fleet which cannot be so sold should be scrapped as soon as the U. S. Army, U. S. Navy, and WSA are through with it. The ships that should be sterilized and laid up for future emergency are those that have been converted for war purposes and are now operated by the Navy and the Army.

Such a program as this would neutralize surplus ships, would attract private capital to American shipping and would keep our shipbuilding industry in a healthy condition.

(Another editorial appears on page 120)

The Annapolis

OF OUR MERCHANT NAV



Truxton Arcade; Ovol and Wiley Hall in background.

By Commodore Giles C. Stea
U. S. N. R.

THE PRESIDEN the United States, in his messa the Merchant Marine Academy dedication day, Semptember 30, stated that, "Kings Point is t merchant marine what Annapoli West Point are to the Navy Army." There is already abu evidence that the founding of institution as a National Acade attracting to careers at sea a type of young American man the equal of whom will be fou few places outside of Annapoli West Point.

While this National Academ but recently been brought into o tion, it is not beginning entirely "scratch." At its founding in the Naval Academy already ha hind it a wealth of naval trad from the glorious pages of our history. The Merchant Marine A emy has likewise been launche its career with an ample and im sive background that reaches farther into the past.

This Academy and all th stands for marks a new starting for the solution of an old pro Men who have cast their lot i armed forces of the country ha ways had to forego any thoug great financial gain. To compe for this, there has been the personal esteem enjoyed by th

(The author is Superintendent, U. S. M Marine Academy.)

ON THE FACING PAGE:

(1) Main entrance of Wiley Hall.

(2) View from Wiley Hall, looking ac Fitch Building and Fulton Hall in ba ground.

(3) Formation Square (now called B ney Square) and Delano Hall.

(4) Potter Hospital.

(5) Fulton Hall.

(6) Bowditch Hall.















The Regiment of Cadet-Midshipmen in mass formation on Kendrick Field.



Regimental Color Guard on Formation Square (now called Barney Square).

ficers of our two armed services at the hands of the people at large and a certain security derived from being employed by a generous and grateful nation.

Contrasted with this has been the fact that the licensed officers of our merchant marine, while being in the same boat with the Army and Navy in regard to the lack of any prospect of great monetary reward for their services, have not at the same time been accorded the degree of deference and respect that has characterized the attitude of the general public toward the officers of our armed forces.

But now that we have our National Merchant Marine Academy, it seems logical to believe that, after the war when we return to peacetime pursuits, the graduates of this institution will be assured of employment by the operation of the largest mercha fleet in our history.

This war has confirmed the n cessity of maintaining a strong, wel trained Merchant Marine Naval R serve whose officers will be qualifie for immediate service in the event an emergency. In order to assure th adequacy and efficiency of this r serve, close cooperation between th Navy Department and the marine in dustry is essential.

It will not be enough for the grac uates of the Merchant Marine Acad emy to receive inactive commissior in either the Naval Reserve or Mar time Service or both. Nor will suffice for them to be practically a sured of employment in private in dustry. They must be offered th prospect of honorable careers in th merchant marine in such a statu that this employment is recognize

Training vessels at Mallory Pier, Hogue Basin.



s service to the Government and
o the nation.

It is with these thoughts in mind
hat the merchant marine and the
naritime interests of the country
hould face the future.

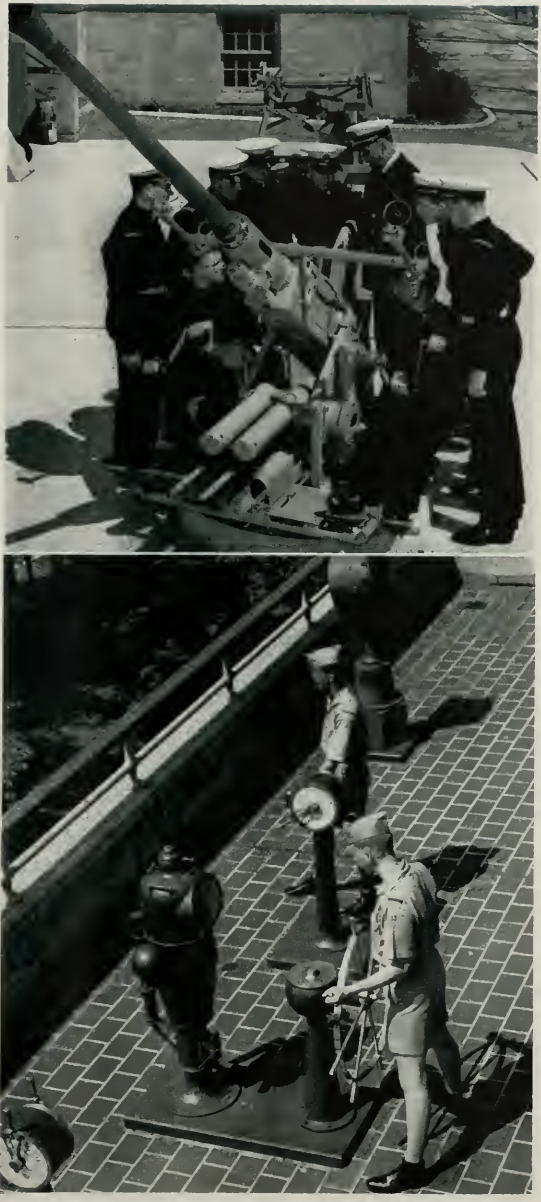
Kings Point is located on the north
hore of Long Island about 20 miles
rom New York. The property com-
rises 60 acres, which include the
states of several well-known men,
he largest of which was the 11-acre
lot of the late Walter P. Chrysler.
The majority of the houses and other
tructures on the property have been
liminated. Only those which can be
uited to the training program have
een retained. The building program
hich was started in September
942, is now completed at a cost
f over eight million dollars. These
ew buildings are of permanent con-
ruction and modern in every re-
pect. In addition to the buildings,
here are a large drill field, tennis
ourts and swimming pools.

The Academy is self-sustaining,
aving its own water, heat, emerg-
ncy lighting, fire department, police
orce and all the numerous ship's
ervice or "P.X." activities. This last
ncludes a soda fountain, candy shop,
ilor shop, laundry, cobbler shop,
hotography shop, barber, numerous
quipment stores and a gasoline fill-
g station.

The Academy is well equipped for
ducating and training the Cadet-
lidshipmen. We probably make
reater use of audio-visual aids than
ny institution in the East, and each
assroom is fitted with a projector
nd screen. In addition, the many
ew devices which have been devel-
ped since the beginning of the war
nd are still on the restricted list
ave been made available to the
cademy. The Marine Department
as three major training vessels and
umerous small craft, with the result
at it is possible to supplement class
ork with frequent cruises on the
ound.

The personnel of the Academy
onsists of 292 officers and 850 en-
ted men and civil service women.
bout one-half of the officers are
avy or Naval Reserve—the other
lf Maritime Service.

There are 2650 Cadet-Midshipmen
esently at the Academy, although
e peacetime complement will be
st 1200. The Regiment numbers
00 and does not include the fourth
ass or basic training group, which



Top of page: Anti-aircraft gun drill an gun platform of O'Hara Hall. Bottom: Ship's Bridge on the Fourth Deck.



Commodore Giles C. Stedman, U.S.N.R., presenting the Merchant Marine Distinguished Service Medal to Ensign Elmer C. Donnelly, U.S.N.R., an Academy graduate, while Capt. P. C. Mahody, U.S.N.R., stands by.



"The Day of Days," when diplomas are presented.

totals 250. The Regiment of Cadet-Midshipmen is modeled after the Regiment at Annapolis and the rules and regulations for its government closely parallel those of the Naval Academy. It is self-governing, in that Cadet-Midshipmen officers have all the authority within the Regiment of commissioned officers; the Regimental Officers of the station simply act in an advisory capacity. There is considerable Regimental spirit and pride if one's company reaches a high level. Although the Academy is just over a year old, there is already tradition, and the Cadet-Midshipmen are building up more every day.

There are many extra-curricular activities which occupy the little leisure time that is available. These activities include:

Polaris, the monthly magazine edited and published by the Cadet-Midshipmen, with no assistance from outside, which carries national advertising and has a circulation of over 8000.

Propeller Club, the second largest in the United States, with 674 members.

Sailing Club

Debating Team

Glee Club with 40 voices

Orchestra

Drum and Bugle Corps

Dramatic Club

Camera Club

Special Drill Team

Tin Fish Club, which is composed of men torpedoed at sea during their training course, and which now contains 495 men who are upper classmen at the Academy at the present time.

For the period of the war, athletics are restricted to an intramural program, although light, informal outside competition will be scheduled during the next year. There is a large and competent staff of physical education instructors, with experts available for coaching each major sport. These include four well-known college and professional football players, a big-league baseball pitcher, and the track coach is Greg Rice, former two-mile champion. There is a large and well-equipped gymnasium, and all Cadet-Midshipmen are required to exercise daily. In addition there are four classes in physical education included in each week's routine.

The course of training is an outstanding feature of the Cadet Corps in that it is the only one at the present time that provides an opportunity for trainees to gain experience afloat at sea in combat zones. The length of the course is two years, which is broken down as follows: 4 months basic training, a minimum of 6 months (and an average of 8 months) as Cadet-Midshipmen aboard merchant ships at sea, one year advanced training at Kings Point. The age range is from 17 to 23, and 15 units are required for admittance. This is the equivalent of a high school education. In peacetime competitive examinations are held prior to appointment, but during the war these have been dispensed with and all appointments to the Academy are made on an educational certificate. Each state has a quota based upon its population, and presently at the Academy there is representation from every state and territory. Incidentally, I might say that practically every seaboard state has filled up its quota, while New York, New Jersey and Connecticut all have long waiting lists. The physical qualifications for admittance are similar to those at the Naval and Coast Guard Academies, and because of the high standards maintained it is not possible to obtain a waiver of any physical defect.

There are three basic training schools where the Cadet-Midshipmen receive training prior to assignment to merchant ships. The largest of these, with a complement of 550, is

San Mateo, California. The next size, with a complement of 350, at Pass Christian, Mississippi. Then, of course, there is the smallest one at Kings Point, which can take care of 250. Regardless of where one may obtain basic training, all successful candidates come to Kings Point for advanced training.

Wartime Courses

The wartime course is a very difficult one, with 40 assigned periods per week. This is broken down into 16 periods of prepared lessons and 24 periods of drill, laboratory, etc. The attrition is high, 37 per cent being eliminated in 1943. The greatest elimination takes place in basic training—15 per cent bilge out and an additional 13 per cent are washed out at sea, while 9 per cent fail to survive the advanced training. The average age of entry in 1943 was 19 years, 3 months, and the average education, the end of the freshman year in college.

During 1942 the casualties sustained at sea while training exceeded 4 per cent higher than all the armed services combined. By 1943 it had dropped to 1 per cent, while at the present time the losses are at a minimum and one seldom receives a report of a Cadet-Midshipman casualty. During the time a Cadet-Midshipman is at sea he is constantly under the observation of the ship's officers, who make reports on him. He is obliged to complete a sea project which requires 29 hours of work per week for a period of six months and he is frequently visited while the ship is in port by District Cadet Corps Supervisors, who check on his progress and general aptitude for the service.

The records are filled with the experiences of these young men who during thir sea training have piled up an amazing story of adventure and heroism. Over 137 have lost their lives, 451 have been torpedoed and survived. There are hundreds who were on board vessls which had collisions and groundings and were damaged by enemy action.

Through my contact with these youngsters and their experiences, I am convinced that we shall not fail. By the weight of our numbers and the superiority of our product we will gain strength and prestige—and respect for Kings Point will reach beyond the borders of this nation and across the seas to distant ports of the world.

Upper left: Navigation Chart Room. Upper right: Diesel laboratory. Lower left: Steam laboratory. Lower right: Gyro laboratary.





U.S.S. Relief, oldest Navy hospital ship in point of service, was among recent ships to undergo repairs in the Alameda yard of General Engineering and Dry Dock Company.

Expansion of Bay Area Shipyard

The company's new construction activities have centered around the AM type of fleet mine sweeper pictured below. These vessels are doing an important job in clearing the way for invasion forces in the Pacific.

The General Engineering and Dry Dock Company, with the shipbuilding yard at Alameda and repair shops and waterfront facilities in San Francisco, has recently taken over the Pacific Bridge Yards Nos. 1 and 5 in Alameda, and with this addition now becomes one of the largest ship repair yards on the Pacific Coast.

Combined with the present Alameda installations, the added facilities will give the company a half mile of continuous, well-equipped water frontage, not including Yard No. 5 of Pacific Bridge, which is located across the Estuary in Oakland. Yard No. 5 will add considerably more area and frontage, and is likewise well equipped for outfitting and repair work.

For many years the company's shipyard at Alameda has built up an excellent reputation for repairing and reconditioning of all classes of naval and merchant vessels. Its splendidly equipped machine shops in San Francisco are well known for prompt and efficient repairs to all sizes and types of marine engines.

The new facilties will make available for repair work three graving docks each equipped with a gantry crane. Large traveling cranes, operating on rails throughout the shops and docks, will help speed up the handling of material in these yards.

The executive staff of General Engineering and Dry Dock Company includes: George A. Armes, president; W. L. Montgomery and Jack Armes, assistants to the president; James H. Young, vice president; P. P. Mesquita, secretary and general manager; Frank Fox, chief engineer and manager San Francisco plant; H. C. Hanson, manager Alameda plant; A. G. Gaffney and George Walker, personnel managers; and Bill Bergman, chief dispatcher.





Above: This view of the Alameda yard as seen from Government Island shows the floating drydock at left, outfitting docks, marine railway, and the ways at right.



Right: A major portion of the yard is now devoted to repair, as this view shows. Shops, warehouses and offices are shown in the background. Pipe and sheet metal shops are just to right of flag in this picture. Large building in upper center houses machine shop and rigging loft.

(Official U. S. Navy photograph)



This 550-foot floating drydock, consisting of six mammoth U-shaped pontoons or sections, is handling vessels up to a maximum of 12,000 tons in the Alameda yard. Ships drawing up to 25 feet can be brought into this dock. Flooding and pumping can be controlled either from the dock or a central station situated on the wharf.



A BD-1 — the U. Navy's new attac transport — shown u der way.

(All photos courtesy Westinghouse)

POWER PLANT *on the* BD-1 *Transports*

DURING THE last six months of 1944 the Shipbuilding Division of Consolidated Steel Corporation Ltd. at its Wilmington, Calif., yard completed and delivered to the U. S. Navy 21 attack transports of the BD-1 type. Eleven more of these vessels are now in course of construction and outfitting and are being delivered during the first quarter of 1945.

The detail designs for this type vessel were prepared by Joslyn and Ryan, naval architects of San Francisco. In the September issue of "Pacific Marine Review" we published a comprehensive article describing the methods used by Consolidated Steel in the fabrication, assembly and outfitting of these ships. The present article describes their turbo-electric power plant.

Paramount purpose in the design of these vessels is the transport of fully-equipped troops ready to land and fight on hostile beachheads. The principal characteristics are shown in the table herewith. As will be noted in the illustration, this type hull has modified Meierform bows and cruiser stern.

Differing slightly from other turbine-electric driven ships built during World War II, these ships have a twin screw arrangement with automatic stability regulation provided by Rototrol — a Westinghouse development. This device, in the form of a motor-generator set, controls the excitation of the main generators being responsive to load changes on the propulsion motors. By this arrangement, used for the first time on vessels of this size, the field current of the main generator is automatically maintained at the minimum value required to insure stability between the main generator and the motor for any load condition.

Propulsion, auxiliary machinery and their accessories are located amidship at the hold level. Control equipment is banked on the second platform in two sections in the forward and aft machinery spaces. This provides the maximum placement efficiency, in that the machinery is located directly above the deep tanks at the 6-foot level, enabling ship

General Characteristics DB-1

Length O.A.	426 feet
Length W.L.	400 feet
Molded Beam	58 feet
Depth, Main Deck	28 ft., 6 in.
Deadwght. Cap. Tot.	6500 tons
Load Displacement	8500 tons
Load Draft	15 ft., 6 in.
Fuel Oil Capacity	1544.3 tons
Diesel Oil Capacity	51.4 tons
Fresh Water Cap.	168 tons
Reserve Feed Cap.	100 tons
Salt Water Ballast	174 tons
Cost	$4,000,000 plus
Total Capacity	1000 men with
(Includ. Ship's Crew)	full equipment
Propulsion	Twin screw
Engines, 2	Turbo-electric
Total shp	6000
Steam Pressure	450 psi
Steam Temperature	750° F.
Electric Voltage	2210

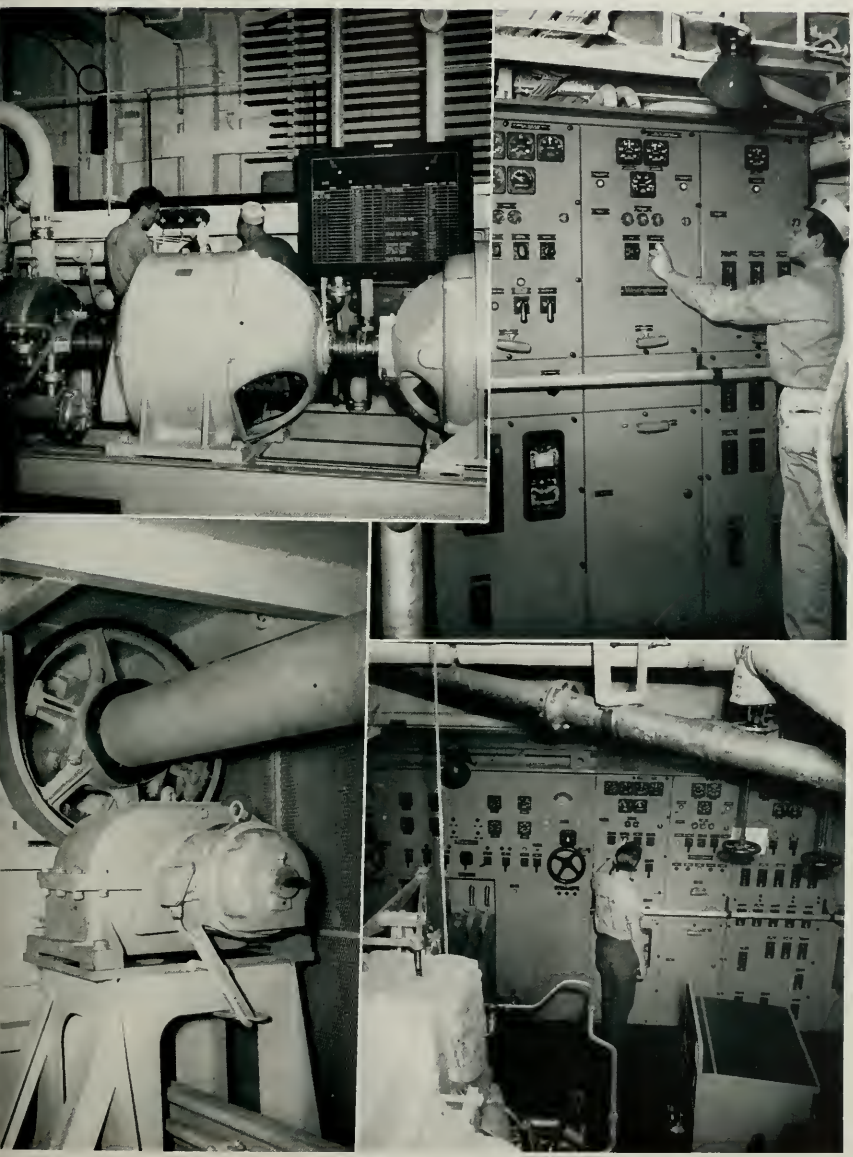
ON THE FACING PAGE:

Upper left: This turbine-drive generator set is one of three identical sets that provide ship's service requirements.

Upper right: Control of power for one of the three 250-kw turbo-generators.

Lower left: Turning gear drive is installed in the shaft alley.

Lower right: Main switchboard and propulsion control boards.



operators to utilize the weight of the machinery to better advantage in trimming and ballasting.

The propulsion equipment comprises two Westinghouse turbines of the straight impulse type, each of which drives a 2550-kw, 2210-volt, 3-phase, 82½ cycle, 4950-rpm maximum continuous rating Westinghouse generator. The turbine and generator are connected by means of a solid coupling and together form a three-bearing unit with two bearings being supported by the turbine structure and the third being carried in the outboard pedestal. The bearing bracket at the inlet end of the turbine carries the turbine journal and thrust bearing. The No. Two bearing, supported in a bracket on the exhaust end of the turbine, carries one end of the generator rotor, and the No. Three bearing mounted in the outboard pedestal carries the other end.

No bedplate is used under either the turbine or generator. Each part rests on the condenser and is set to the proper grade and centerline to bring the rotating element into correct alignment. Each of the two main condensers on the vessel has 934 tubes, ¾ inch O. D. and 12 feet long, providing 2200 square feet of cooling surface. These condensers are of the Westinghouse Radial Flow design.

Under normal steam conditions the turbine is designed for an inlet pressure of 440 pounds pressure per square inch gage at a total temperature of 740 degree F. At this rated operating condition the turbine will develop a normal load of 3000 shp with a continuous overload rating of 3300 hp per shaft. Steam requirements for the main and auxiliary turbines are met by boilers located in each engine room just off the centerline. They are of the single-pass, sectional header type, supplied by Babcock & Wilcox, and rated at 750 degree F. total temperature, and deliver 450 pounds pressure per square inch at the turbine.

Electrical energy developed by the turbine-generator units is used to operate a pair of Westinghouse propulsion motors, each direct-connected to a main shaft. Each of these two electric motors is of the synchronous marine type with a maximum duty of 3300 shp operating at 165 rpm. Speed control is obtained by varying the speed of the turbine-generator, located in the same engine room as each motor. To increase economy at low speeds and also to provide for emergency drive from one turbine-generator, the control is arranged so that both motors can be operated from one turbine-generator and either unit can be selected to provide the power. Maximum propeller speed when operating both motors from one turbine is 100 rpm.

The forward engine room equipment normally provides the power to rotate the starboard propeller at the end of a shaft approximately 12 inches in diameter, 175 feet 6½ inches long, and weighing 57,950 pounds. The port screw normally is driven by the after engine room machinery and is capped to a shaft of the same diameter, 133 feet 10½ inches long, weighing 36,500 pounds. These propellers are 11 feet 6 inches in diameter and have a blade pitch of 13 feet.

Electricity for ship service is developed by auxiliary generators located at the 14-foot level in the forward and after engine rooms. Three 250-kw units composed of a Westinghouse a-c generator and a Worthington geared steam turbine provide 312.5 kva, 450 volts. One of these units is located alongside each main turbine-generator, and the third is installed between the two engine rooms next to the fresh water tanks. A Westinghouse 100-kw turbine-generator unit is installed in each engine room and generates 240/120 volts d-c for pump motors and to supply other direct current needs. Each 250-kw auxiliary turbine generator set also includes a 90-kw Westinghouse generator supplying 125 volts d-c for excitation of the propulsion motor and generator.

Control equipment for these vessels is designed to perform the following functions:

(1) Start, stop and reverse the propulsion motors.

(2) Vary speed of motors between approximately 20 and 100 per cent of rating by varying the turbine-governor setting.

(3) Provide steam-flow limit control.

(4) Provide for parallel operation of both propulsion motors from either of the propulsion generators if desired.

The entire control system is protected by a mechanical interlock assembly which insures a predetermined sequence of lever operation. This inter-locking prevents speedin up of the turbine with the startin lever in any mid-position betwee "Off" and "Run." It also prevent moving the starting lever to its "Ofi position with the turbine speed leve at other than "Idling" or "Off." I addition to this mechanical inte locking system, the starting-reversin switch group and the main set-u switch group are interlocked so tha when set up for two-motor operatio from a single generator in a remot engine room the local starting swite group, hence the starting lever, locked in its "Off" position.

Another precautionary design fe ture of the control system is the mar ner in which the main and contr circuits running between the engin rooms can be isolated. These mai engine room circuits, as well as th standby exciter circuits, all pas through contacts in the various set-u switches. Thus, when operating no mally on single motor set-up, all ci cuits between the two engine room and the standby exciter room can b completely isolated from the othe in emergencies.

Stability regulation of the propu sion system is effected by Rototro control of the excitation of the mai generator field. The output of th Rototrol is used to energize the shun field of the 90-kw exciter. The Roto trol, which is a special small d-c ge erator, has a pattern field which r ceives its excitation from a 1.2-k 125-volt constant potential excit which is part of the Rototrol moto generator set, which has a 5-hp a driving motor.

The Rototrol also has a differenti field which is responsive to chang in the ratio of voltage and frequen of the main generator, and a cum lative field which is responsive t changes in load (line current) of th generator. The fields are so propo tioned that the Rototrol automatical maintains system stability throughou the complete range of speeds ar loads on the propulsion units.

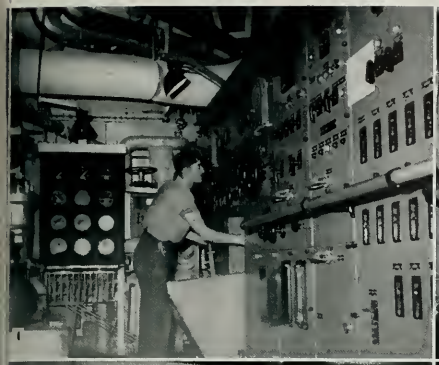
The ship's auxiliary power syste has a complete ring bus arrangemen which provides maximum flexibili and safety in power supply to vit auxiliaries. The system comprises total of 11 Westinghouse switch board units, as follows:

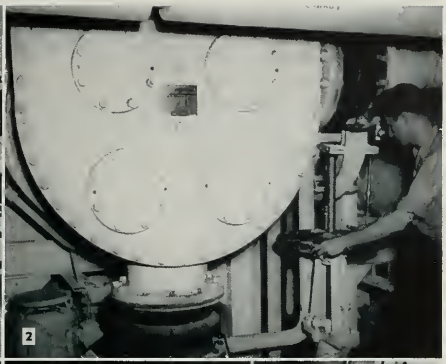
Forward generator

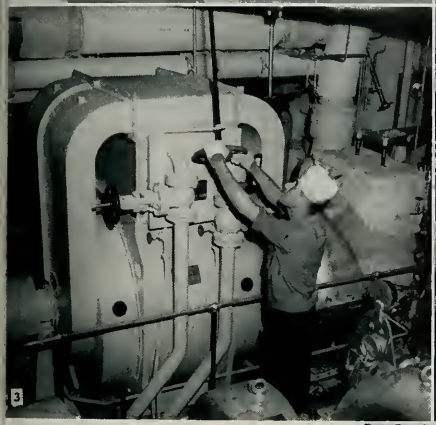
After generator

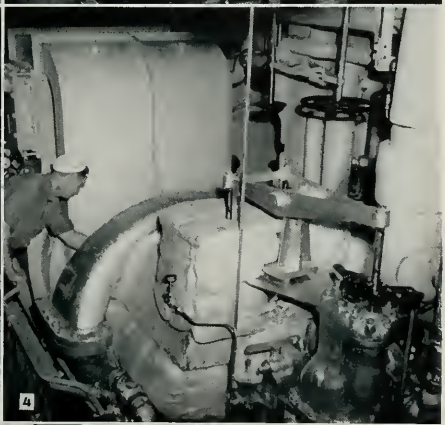
Auxiliary generator

(Page 120, please)









(1) Directly ahead of the steam inlet end of the main turbines in each engine room is this Westinghouse propulsion and main distribution board. Rear left is the gage panel for steam conditions.

●

(2) The exhaust steam from the main propulsion turbine-generator sets is handled through Westinghouse condensers of the type shown in this illustration.

●

(3) Propulsion generator unit, showing cooling system. Turbine drive is at right.

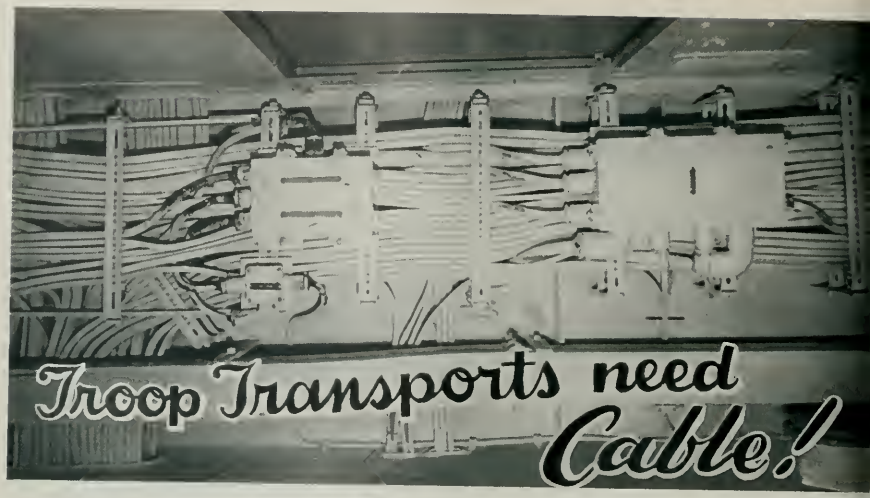
●

(4) Propulsion turbo-generator from turbine end. Governor mechanism is in right foreground.

●

(5) Forced draft requirements on the furnaces of the main propulsion steam generators are supplied by a pair of Westinghouse turbo-blowers in each of the forward and after engine rooms.





Calship Finds AP-5's Use Five Times As Much Cable As EC-2's

An electrician in the Terminal Island yard of the California Shipbuilding Corporation stepped back from the forward bulkhead in the engine room of an attack transport.

By Howard De Freitas

"Wow, just look at 'em!" he exclaimed. "More than 40 cables in that one wire-way!"



Lighting distribution panel.

This offers but mild evidence o the role electric cable plays in th proper construction and successfu operation of one of these AP-5's At the same time it presents a example of the vastness and com plexity of the electrical system o these vital combatant ships as com pared with the Liberty and Victor ships.

Figures gleaned from Calship blue prints show that the yard used abou 23,000 lineal feet of cable per hul in building 306 Libertys and 30 Lib erty tankers. This total was uppe to 58,000 feet for each of the firs 32 Victorys the yard delivered. I was with the advent of the transpor program, though, that the cabl needs multiplied by miles instead o feet. No less than approximatel 167,000 feet, or more than 31 mile of cable, are strung through eac of these seagoing warriors.

The reasons for this extensive us of cable are readily understandabl when two features of the transpor are considered. In the first plac the AP-5 is designed to carry hun dreds of combat troops in the space occupied by cargo in the basic Vic tory design. Secondly, the transport are fighting ships, bristling with gun and carrying the Navy's latest battl equipment.

ON THE FACING PAGE:
A ceiling scene, cabin deck forward thwartship passage on an attack transport.

The transformation of cargo space to berthing, eating and medical accommodations for so many troops ost about trebled the chores of Calip electricians. For the first time ey found themselves wiring dental ooms, surgical rooms, dressing staons and many such installations as echanical cows, ice cream rooms, ike ovens, and dough-mixers for ll-fledged bakeries.

In addition, they had to hook up ectric fans for vastly larger venation systems and connect enlarged frigeration units. The mechanical undry and pressing equipment were ewcomers on the to-be-wired list, were the heavy machinery instaions.

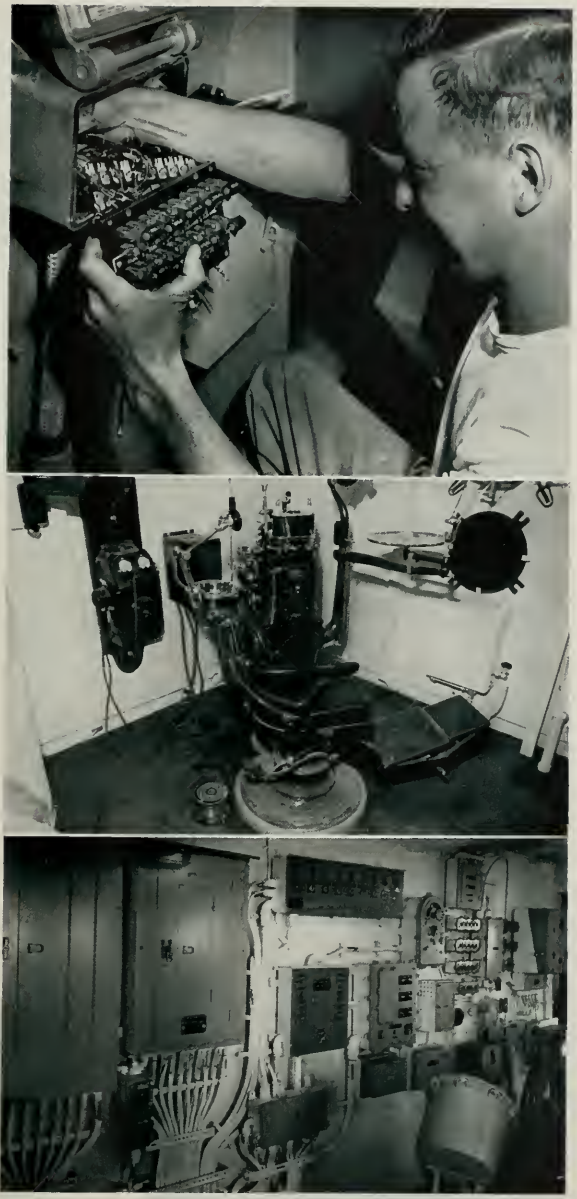
Power lines likewise were necesry to the functions of the winches d the big davits from which hang e all-important landing barges.

The lighting system also graduated to a more complex stage, with the rths alone requiring a large share the fixtures.

This, however, was only half the ory, for many were the thousands cable footage necessary to equip e vessels as fighting craft according Navy specifications. Range-finders, n directors, radar, announcing sysns and intricate telephone comunications all had to be hooked up flawless manner, while many manurs had to be worked on the three dio rooms.

Supplying the power for all these stallations are three 300-kw 120/0-volt shunt-wound generators, or e more main generator than the ctorys required. With this set-up, ough electricity is generated to rnish light and power for approxitely 300 average-sized homes. The nsport also has additional AC gentors to supply power for the IC tem and an emergency dieselerated standby generator.

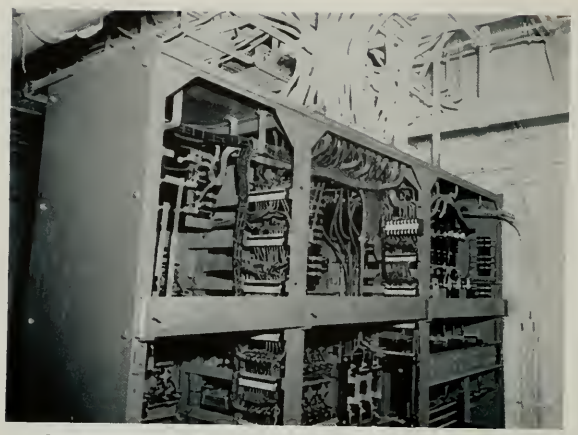
The wiring of all these fixtures



Top of page: Connecting a battle telephone tie switch box.

Center: The dentist's torture chamber uses much portable rubber-covered cable.

Bottom: On the pilot house after bulkhead. Synthetic resin lead and armored and varnished cambric lead and armored are the chief types of cable employed.



Rear view of communications and action cut-out switchboard. More than 50 cables run into this interior.

requires exactness in cable sizes and types. Decision on this score rests, of course, with the engineers and technicians, but their specifications must be carried out exactly by the electricians.

The electrical system on the troop transports, in general, is designed to utilize Merchant Marine Shipboard Cable. The sizes and types are determined by individual usage in accordance with established marine practice.

The power and lighting systems require the use of Synthetic Resin Lead and Armored Cable (SRL&A) and Varnished Cambric Lead and Armored cable (VCL&A), depending upon the ultimate use. Cable systems vary from 400,000 circular mills to No. 14 AWG single conductors and 2/0 AWG to No. 1 AWG triple conductor cable. In the type, the general construction embrances stranded copper conductors with synthetic or varnished cambric insulation which is covered, in turn with insulating compound-filled tape or braid. The latter is color-coded for circuit indentification. The individual conductors are separated and spaced by the use of fillers. The conductors are then spiral-wrapped with insulating compound tape, after which the are covered entirely with a lead sheath. A bituminous compound is placed around the lead sheath and is covered with another layer of insulating compound-filled tape prior to the final operation, which calls for a coating of braided metal armor to protect the cable from external damage.

The cable used for interior communications is designated as Interior Communication Lead and Armored (ICL&A), and varies from two to 30 conductors. The conductors are 2828 circular mills in area and are individually color-coded to facilitate installation and circuit designation. The construction is similar to that of the power and lighting cables except that the fillers are eliminated in the cables with six or more conductors.

Twisted Pair Telephone Lead and Armored cable (TPTL&A) is used in the sound-powered telephone systems, and consists of from one to 20 twisted pairs of conductors. These conductors also are 2828 circular mills in area, and the individual conductors also are color-coded for identification.

The basic difference between telephone and interior communication cable is that the telephone cable has its conductors twisted in pairs. The construction of the cable is identical to the interior communication cable.

The AP-5's also call for the use of several special Navy-type cables on the interior communications, radar and fire-control systems. The general construction of most of these types is similar to the commercial cable, except that an impervious sheath of heat- and flame-resistant material is used in place of the lead sheath. Still another requisite is Navy-type portable oil-resistant cable. This is used on the power feeds for the train and elevation of the guns.

Truly, electric cable might well be called the life-lines of a modern troop transport.



The bright eyes and nimble fingers of journeyman electrician Irene Flesher "crimp a lug on a lead" with stakon pliers in a telephone junction box.

Efficient Auxiliaries On C1-A Motorship

Interesting auxiliary engine performance reports given by O. T. Reddin, Chief Engineer of the Motorship Mormacdale, one of the first of a fleet of 46 C1-A design cargo ships built for the Maritime Commission by the Pennsylvania Shipyards, Beaumont, Texas, furnish additional records of the successful service provided by this type of vessel in wartime operations.

Chief Engineer Reddin was highly enthusiastic over the efficient operation of the two Enterprise-Westinghouse generator sets contained in the auxiliary plant of the Mormacdale. In expressing his laudatory comments on the records of the two engines, which are Enterprise DSG-6 six-cylinder models, he said:

"They have seen better than 8000 hours of service, and their performance has greatly pleased me. The maximum liner wear in any cylinder just below the travel of top compression ring is .008 inches.

"The two Enterprise engines are operating on a weekly alternating schedule, as one engine usually furnishes ample power to take care of the load requirements. When an engine is shut down for a week, lubricating oil is pumped into a settling tank. After settling, it is then centrifuged and used for make-up oil in the two main propulsion Nordberg diesels. Thus the auxiliary power engines get a complete change of lubricating oil (Gargoyle DTE Marine oil No. 3) for every week of operation."

The Enterprise-Westinghouse generator sets on the C1-A motor vessels comprise the neatest and most compact arrangement of auxiliary plant found in any of the Maritime Commission ships. The two units, each of 250-kw capacity, are placed side by side, with ample working space around them and the space above the engines kept clear of piping. Each, of course, is a self-contained unit, with water and oil pumps and heat exchangers built into them. The engine and generator are mounted on a common steel sub-base and the engine drives all of its own auxiliaries, including sea water pumps, fresh water pumps, lubricating oil pumps, and fuel transfer pumps. With 12-inch bore by 15-inch stroke, each engine is rated 450 hp at 450 rpm

The ships of C1-A design represent an important phase of the great program of diesel vessel construction being carried on by the Maritime Commission. With a hull 414 feet long, beam of 60 feet, and a load draft of 23.6 feet, these craft have a deadweight of 7416 tons. Equipped with two 2000-hp Nordberg diesel engines for main propulsion, they have a normal speed of 14 knots and their cruising radius is 10,000 miles.

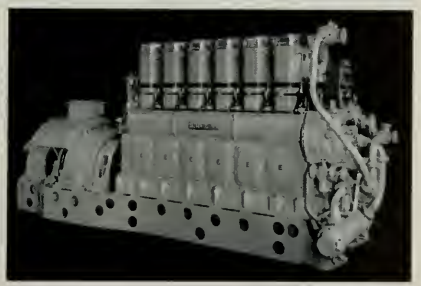
The Mormacdale and other of her sister ships completed early in the C1-A construction program were assigned to carrying cargoes to the Middle East, Mediterranean and other danger zones. They bore the brunt of the job until Libertys were available to assist them in these strenuous and hazardous operations. Before the advent of convoys, they sailed out into the oceans alone, and stories of their many heroic deeds and seemingly insurmountable feats will glorify the pages of history in generations to come.

It is these war experiences of the earlier built ships that have resulted in numerous minor changes and improvements in the more recently completed vessels. One such improvement is the provision of means of escape in case of torpedoing or bombing. Every compartment or room, even the bathrooms, is equipped so there is no danger of anyone's being trapped by jammed doors or hatches.

Another war lesson is seen in the protection of the pilot house against machine gun bullets; also in the manner in which deckhouse entrances to the outer decks are arranged to prevent light from showing. In fact, this arrangement is so good that it is sometimes difficult, even in daylight, to locate the doors.



Above: The Mormacdale, one of the first of a fleet of cargo ships built for the Maritime Commission by the Pennsylvania Shipyards.



Right: One of the two auxiliary generating sets on the Mormacdale.



An LSM on trial run.

New LSM Technique At Federal Yard

Assembling a section of an LSM in special cradle.



Building a "ship-and-a-half" pe shipway is among the contributio toward whipping Japan quicker mad during recent months at U. S. Steel Federal shipyard.

This technique has sped some 3 fighting ships towards war in abou the time that would be required t build 20, using standard one-ship per-way methods. But the stor couldn't be told sooner because th vessels so constructed — Landin Ships, Medium—nicknamed by th Bureau of Ships "Pacific Puddle Jumpers"—were on the Navy's se cret list for many months. And they were on the must-rush list—and stil are — for many greater assaults on Jap held territory and Japanese beach heads.

In using this newest Federal ship assembly technique, while an entir 203-foot LSM is built on the lower waterward, part of a shipway, a 91 foot stern section simultaneously "grows" on the upper part of th way.

When the completed landing shi has been slid into Newark Bay— without ceremony or bottle-blessing the "half-ship" is moved down to wards water level, where forward sec tions are added. Meanwhile, o course, another stern is assembled The gain is, roughly, turning out three hulls in the time and space nor mally required for two. And a 5

er cent gain is rated quite something n global, speed war.

LSM shipbuilding technique as racticed here is "prefabrication lus." Only six main "hunks," or ctional "slices," which have been uilt in "cradles" in a vast outdoor ssembly area, are required for the ssembly of a complete hull. The ain deck housing, topped by a con- ing tower, goes aboard as one unit. his means that, in all, but seven ig sections, plus sundry smaller parts," are required to complete hull nd superstructure.

To the fullest extent possible, ma- hinery, tankage, piping, wiring and ther items are fitted into the pre- bricated sections as they are built n land, thus further reducing the mount of construction work done hile the growing hull is on the ship- ay. The way becomes an "assembly ation." That means each way can e used oftener; more ships can be uilt, faster.

Into the design of this LSM type ave been written lessons of three ears of war. The vessels are offi- ally described as faster than earlier nding vessels, and very maneuver- ble. They give a lot of effective back chat" to air attack.

Of shallow draft, especially for- ard, for operations close inshore, ey are liberally and tightly com- artmented for safety of the ship as whole if there is damage to any art of it while hitting the beaches in vasion action.

This newest of invasion specialists twin-screw diesel propelled and of out 700 tons displacement as load- d for landings on the Pacific's farth- st shores.

The LSM has an open vehicle well xtending the full length of the hull. oaded for action, it's packed with unch. Tanks, and what it takes. All ady to come out fighting, as the ow section and its ramp are low- ed. Around this well a thin "rim" f deck housing also is packed, with any kinds of equipment required to perate a ship.

Below are bunks and mess spaces r officers, crew and landing force; ngine rooms, store rooms, oil tanks nd steering gear. It's a close fit roughout, but the LSM carries erything needed by an ocean-going ghting ship.

The LSM 258, sixth built at Fed- al's Port Newark yard, has been entified in an official Navy photo- raph of MacArthur's landing on eyte.



Above: The "farm" at Port Newark, where slices of LSM deck erections grow.



Right: An LSM deck house unit being spotted on the hull.

Below: A building slip at Port Newark. In foreground is a 91-foot after section of an LSM; in the background a complete LSM. After launching the latter, the former is skidded down to launching position and finished while another 91-foot section takes its place at inshore end of ways.





A "BRL" at the dock ready to be towed overseas.

"BRL" Type Refrigerated Concrete Barges

By K. M. Walker

Three "BRL" type refrigerated barges, Hulls Nos. 45, 46 and 47, have been completed by the Concrete Ship Constructors at National City, California, and have been delivered to the U. S. Army. These vessels have a reinforced concrete hull 265 feet long, 48 feet beam and 17 feet in depth, carrying a wooden deckhouse 216 feet long, 38 feet wide and 12 feet high, insulated and cooled on the conducted cold air principle. Over the forward end of the main deckhouse is a commodius upper deckhouse fitted up with galley, messrooms and crew accommodation.

The reinforced concrete hull has 8" thickness of shell, 7" decks and two full length concrete bulkheads 6½" thick and spaced apart 19". The voids between the bulkheads are used to run the various pipe lines and conduit the length of the ship. There are eight main holds, four on each side of the ship 48 feet long separated by concrete athwartships bulkheads. All hatches are set flush inside the deckhouse and are served by overhead trolleys running the length and width of the deckhouse with extensions led overside through the wide cargo doors. There are two sets of such doors, and the overside trolley extensions fold u out of the way when not in servic

The main deckhouse is separate into two compartments, one forwar of 20,000 cu. ft. capacity and or aft of 24,000 cu. ft. capacity, h means of an insulated wooden bull head. Each of the eight hold com partments has a capacity of 900 cu. ft.

In the after end of the main deck house is the engine room, containin four Worthington diesel engines eac direct driving a 100-kw Westing house generator at 600 rpm. to suppl current for the refrigeration plant.

Two 50-ton York ice machines ar

so located in the engine space in e after end of the deckhouse. These rn at 750 rpm and are V-belt driven General Electric motors of 125 at 1200 rpm. The freezing agent Freon gas. The 6¾" x 5" eight-linder ice machines are designed to erate 720 rpm with a capacity of evaporator and 100° condensing mperatures of 53 tons refrigeration. t this capacity the ice machines sorb 115 brake horsepower. At rtain times the machines will oper-e 105° condensing temperature hen the tonnage will be 50 at 0° aporative.

Each condenser is rated 60 tons frigeration at 100° condensing mperature on the basis of 250 gal-ns per minute of 90° sea water ith a pressure drop of 7½ lbs. The ine coolers were figured to cool 0 gpm of brine from 8½° to 5°, rresponding to approximately 60 ns refrigeration at 0° evaporator temperature. The pressure drop through the brine cooler is 8½ lbs. with 500 gpm circulation and 2½ lbs. with 250 gpm circulating. Each brine cooler has a rating of 60 tons refrigeration when cooling 250 gpm from 12° to 5° when the evaporator temperature is reduced to —2°. The cooling coils in the holds are rated at 3.84 tons each when cooling the air from 15° to 11° with brine in at 5° and out at 8.8°. This rating is on the basis of a 400 ft. per minute space velocity across the coil, which has an area of 23.8 sq. ft., giving a total of 9,500 cfm. This returns a safe total rating of 50 tons refrigeration when operating with one machine, one brine cooler and one condenser.

A complete ice cream plant is included in the deckhouse, and consists of a York 3¾" x 3" six-cylinder compressor operated at 700 rpm by a 15-hp motor and has a rated capacity of 6.3 tons. The ice cream system is calculated at 5.2 tons, allowing 1.8 tons for freezing, 2.6 tons for hardening and 0.8 tons for leakage load in the hardening room. The required brake horsepower for this delivery is 9.5 when operating at —25° evaporative and +25° condensing temperatures. The 12" × 5' 0" four-pass brine cooled condenser was figured on the basis of using 30 gallons of +5° brine with a 1-lb. pressure drop. If the condensing pressure should get as high as that corresponding to 40° the brake horsepower requirement would jump to 10.9. As the extreme operating conditions could not be foreseen, a 15-hp motor was installed in the ice cream system and a high temperature brine safety thermostat was installed and arranged to shut down the plant automatically if excessive temperatures were encountered.



One of the deckhouse cool chambers. Note overhead trolley.



The "Tiddlers," new type of small steel tug for any towing service. Prefabricated by shops in the interior, these vessels are put together complete in four and a half days at special shipyards.
(British official photo)

Britain's Shipbuilders Form A "Brains Trust"

by Sir Patrick Dollan

NEW METHODS and new processes must be adopted in keeping with what has been learned during the war—those are the post-war plans of Britain's shipbuilders. Two research committees have been appointed to pool ideas and discover new designs, all of which will be made available to each firm so that mutual aid will be the characteristic principle of the industry instead of competition.

These committees include the best designers, engineers and builders in England and Scotland, and will be guided by men like Sir Stephen Pigott, chairman of the famous firm of John Brown and Company, Clydebank. He was a responsible supervisor for the construction and equipment of the Queen Mary and the Queen Elizabeth, H.M.S. Duke of York, and for many other famous vessels before and during the war. With his experience of the highest grade of marine engineering in the United States and Europe, he will be a valuable counselor for the research committees.

Britain's Government has also appointed a committee representative of shipowners, builders, shipyard operatives and the State departments to program the construction of ships on the basis of full employment. This would seem to indicate that shipping and shipbuilding authorities are anxious to avoid the rapid inflations and deflations which caused so much hardship to labor and employers in the years between the two wars.

It is well realized that the industry is better equipped and machined than ever before in history; it is also realized that the needs of peace may find the trade overmanned. The personnel will therefore be reduced—probably by asking women and others who volunteered for war service to return to their normal duties—when the European and Pacific naval and merchant ship operational programs have been completed.

The harmonious and practical collaboration with the United States and Canada in exchanging designs and information is expected to continue. Highly appreciative of this great help, Britain's shipbuilders anticipate that they—and the rest of the Allied Nations—will be able to program for the prosecution of the war.

Post-war prospects of production

(The author is a member of the Clyde Navigation Trust and Lord Provost of Glasgow.)

distinctly encouraging. The industry is now particularly well-equipped to produce excellent mercantile vessels. Over $40,000,000, in fact, has been spent on the installation of new machinery and cranes—all of which will be available for future mercantile contracts.

Murray Stephens, president of the Scottish Institution of Engineers and Shipbuilders, and chairman of one of the most important Clydeside companies, said recently, when referring to the possible surplus of shipping after the war:

"We must be broad-minded in our approach to this problem and pay tribute to the United States for the fully colossal effort in building the war fleet, which has done so much to make victory possible. We must have sympathy with them in their deliberation over the solution of their problem."

This would indicate that Mr. Stephens and his colleagues believe that success in the future will depend on the continuance of the collaboration that has made Allied shipping output so phenomenal during the world conflict.

New processes, such as prefabrication and welding, are being adopted on an increasing scale, with due regard to conditions and needs in Britain. Prefabrication is not altogether new to the country; neither is the construction of ships in part for dispatch overseas or launching a distance from the place of assembly. Clyde firms for many years have sent ships in numbered packing cases for assembly in all parts of the world. This is especially true of dredgers, barges and other shallow draft craft for river traffic in India and the Dominions.

One Clyde firm is also simplifying complicated labor methods by adopting what may be described as mass production plans for the foreman and operatives. This has been recommended by the unions and the managerial experts, who say it will expedite production and increase wages. The system has been in use in other Scottish yards where standardized design and construction have been employed with success for some 20 years.

Some of these yards, although restricted to one shift per day because of obvious war difficulties, produced 10,000- to 11,000-ton cargo ship in four months or less. With a three-shift system this would mean one such vessel every six weeks. Troop landing carriers and tank carriers have been built at the rate of two a week also on the one-shift system. The plates and other materials for these smaller vessels were made inshore and sent to the yards for assembly, sometimes by women, who proved very capable for this task.

Britain's shipping companies are now getting ready to place contracts for their post-war special types, but the Government has insisted that the needs of the Pacific war still come first. Vessels of operational type now building may in many cases be adaptable for commercial service. Refrigerated ship contracts continue to be placed to help in the transport of food cargoes to the liberated countries as soon as circumstances permit. The Germans concentrated their attacks on refrigerated ships in the early months of the war and did it so effectively that Britain's food supplies were reduced to about six weeks' reserve in 1940.

Ships launched in Britain in 1940-43 totaled 4,415,668 tons, a figure which exceeded the total for the same period in World War I. This was a remarkable achievement considering that the output capacity in 1939 was less than 1920. It indicates that the industry, once the urgency of war is past, should be able to satisfy all the demands that may arise for commercial and passenger transport. Construction of passenger ships has been wholly suspended during the war, and it is now equally necessary to fill the gaps.

Many yards are being reconstructed and replanned for post-war activities. Hand methods will give place to those of the machine. Wherever the latter can do the work more efficiently and economically it will have preference. Thousands of riveters have been trained as welders and the great majority of tradesmen are now familiar with pneumatic and other electrically driven tools. Training schools have been opened in Scotland and England and are well attended by managers, foremen and craftsmen. Classes have also been organized for apprentices, some of whom have been brought from the highland and rural areas. This, again, is not new, as it has been customary in Scotland for over a century to train orphan boys in the pastoral districts with a view to their becoming shipbuilding apprentices. Some of the best sailing and steam yachts

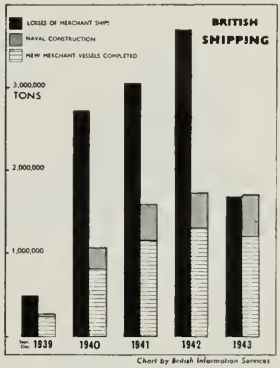


Chart by British Information Services

Scotland ever produced were the work of tradesmen who had been orphaned or boarded-out boys in the highlands.

The marine engineering and shipbuilding laboratories at Glasgow University will be extended. Large grants have already been given for this purpose. Education in the Clydeside, Tyneside and Merseyside areas is blending the practical with the cultural so that the young manhood of Britain may become more appreciative of the value of shipping. They have learned during the war that sea power—naval or mercantile—is the mainstay of a nation which is dependent on exports and imports for its livelihood and progress.

The shipbuilder (and I believe the shipowners) have also decided against the acceptance of German ships as reparations after the war. After World War I they allowed the Government to accept 2½ million tons of reparation ships, which was equivalent to the total output of shipyards in Britain for two years. This policy brought about creeping paralysis in the shipbuilding and shipping trades, with the result that output fell from 672,438 tons in 1920 to 175,529 tons three years later, caused many yards to be scrapped, and gravely reduced the capacity of the industry.

The most hopeful sign of all is that the workers are taking a keen interest in the technique and efficiency of production. They want Britain to have the best merchant marine and the most powerful Navy that British brains and hands can design and build.

An Office Man Looks at Production

By L. E. Dunton

To the boys out in the yard, I take my hat off. As a matter of fact that isn't enough; I also execute a deep bow.

If nothing seems unusual about that, then allow me to point out that I'm an office and white collar man. As a matter of fact, an especially supercilious type of office man. The type that has always had the idea that if the boys out on the production end would use a little more brain power and a little less vocal power then we would build even more ships in even less time.

Ships in this case, but it applies to almost all those products where there is a definite division between the office and the yard groups. We white collar gents have always felt that they paid off too much out in the yard or ships for loud talk. Not only that but we believed that they looked down upon anyone with a tendency to think before he went ahead and did his work. Of course, it wasn't universally true but almost. At any rate many of us thought for years that tremendous improvements could easily be effected if the yard foremen and superintendents would do a little systematizing and thinking ahead. I, for one, have visualized every production record being broken when companies could instill into their foremen the idea that it paid sometimes to do a little thinking along with their cussing. To line up their work, for instance, like we did in the office.

That time has come with a bang. With the help of a supervisory training program put on by the War Manpower Commission, called Job Methods Training and doing just that. The man-hour savings, the cost reductions, the speeded up production schedules, are already becoming legendary among those who know of them. A great deal of praise has justifiably been extended the men responsible for the program. With every word of it, I concur wholeheartedly. But the whole story hasn't been told. Certain surprising facts that the program revealed have been entirely neglected. Almost covered up.

Production supervisors and foremen have actually been "thinking" all this time. It's true not as much as they are now. But still thinking. And to a far greater extent than any of we superior desk jockeys ever imagined.

As an office supervisor, I was invited to attend a Job Methods class. This particular one had in it several Pipefitting Foremen, a couple Electrician Supervisors, a Crane Superintendent, a Material Expediter, and others. The awakening came when we all were requested to describe various improvements that we had already put into practice.

The one that really rocked me back on my heels was by one of the pipefitting bosses who looked like he was much more capable of giving his men a physical going over than he was of thinking out any better ways of their doing things. And I mean I was rocked back. It came out that this loud-talking and tough-looking gent has the fastest gang of water closet (toilet to you) installers in the whole yard. That isn't all they do, but you can see that in a shipyard turning out big transports by the baker's dozen, it in itself is quite a job. And to top it off the secret of his success isn't in the men at all but in the "work sequence" he has thought out for them. The terms were all a little technical for me, but the gist of the idea is that he has figured out almost every step for each of the men. He even had it down to such a fine point that he drops off the boxes needed the next day on his inspection trip the night before.

And then there was the fellow who had figured out a little jig for his men cutting parts that inspectors admitted speeded up one job 900 per cent and cut down waste metal 120(per cent. All this long before Jol Methods or the War Manpowe Commission.

Oddly enough these weren't jus isolated cases. Almost everyone ir the class modestly, in fact almos sheepishly, brought out some star tling bit of evidence that he hac been using some horse sense alon with the customary "horse language." One foreman even admitted to m on the side that he had long been subscriber to certain technical publi cations and had gotten several gooc ideas from them.

The majority of the time I kep my neck tucked deep in my whit collar and thanked the ghost of al office boys that I hadn't stuck it ou on paper with any of my long fos tered but very erroneous ideas abou production stupidity.

(The author is administrative assistant, Moore Dry Dock Company.)

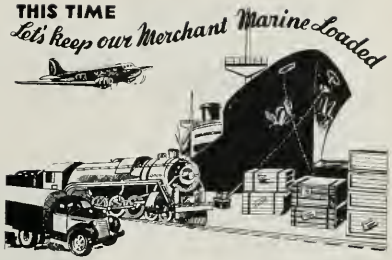
U.S.M.C. "Captain's Technica Library"

The U. S. Maritime Commissio recently announced that a "Captain Technical Library" is now bein placed on each merchant ship. Text were chosen to be of assistance t captains in wartime operation of mer chant vessels.

Recommended by the Crew Quar ters Committee, a group of 28 tech nical publications has been selecte for the library. This selection ir cludes, in addition to 18 publication issued by the Government Printin Office, the following: Standard Sea manship for the Merchant Service F. Riesenberg; Robinson on Admi alty; The Raft, H. Gaty; Pacifi Ocean Handbook, E. G. Mear Weather Around the World, I. R Tannehill; Bible (large print); Mas ter's and Mate's Manual of Nav Architecture, Manning; Oil Tanke Operation, Hillman (for tankers' l braries only); Medical Care for Sea men at Sea, W. L. Wheeler; Sea men's Wage Computer Tables, I Martin.

Pacific WORLD TRADE

By T. Douglas MacMullen



Tariffs—High or Low?

By O. C. Hansen

President of Foreign Trade Association
San Francisco Chamber of Commerce

The approaching expiration of ...e reciprocal trade treaties brings a ...rry of suggestions that the tariff ...rriers be raised again.

That higher tariffs would reduce ...reign trade, both import and ex...rt, is very generally admitted; ...vertheless, we have a United ...ates senator telling the American ...ariff League on January 18 that ...forts to increase foreign trade are ...surd. He uses the demagogic ...ethod of reciting obvious facts or ...lf truths and using them to prove ... proposition with which they are ...t related. "If we are to sell ...broad," he says, "we must buy ...broad" (which thus far sounds like ...od sense) . . . "And if we buy ...om abroad what we can grow or ...ake at home, we are committing ...ational suicide . . . we are being ...ld that if we are to have a full ...osperity in this country, we must ...ve a vast foreign trade, at least ... billion dollars of exports . . . any ...rogram of vast export and equally ...st imports cannot increase the ...ell-being of our citizens."

Although speaking in New York, ...here a large portion of the people ...e directly dependent on shipping ...r their livelihood, we are told that ...e speaker was "cheered." There ...e innumerable reasons why mil...ons of Americans would not agree with the senator's conclusions, and we will mention a few of them.

The protective tariff has a very real place in our economy. There can be no sound argument against protecting the farmer because against cheap foreign competition he is otherwise helpless. And the same is true of many an industry or product which quality or quantity production fail to make competitive. Every item should therefore be separately considered, and the reciprocal trade agreements have proved workable to this end.

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O. C. HANSEN
President Foreign Trade Association, San Francisco Chamber of Commerce; managing partner, Frazar & Hansen.

"As you all know, shipping and foreign trade live and die together."
Frank J. Taylor, President American Merchant Marine Institute

The Future of American Merchant Shipping

By Edward P. Farley

Chairman of the Board
American-Hawaiian Steamship Company

When the war with Japan has been successfully concluded, San Francisco, Los Angeles, Portland and Seattle will be well on their way toward becoming principal commercial and financial centers of the Pacific Ocean trade, and into them will flow a good portion of the business that formerly went to the great European capitals. This is a prediction. From the record, it does not seem to be a risky one. Indeed, it would be a logical development for the immediate post-war period, and it has been foreseen by both corporate and public officials who have already prepared plans to provide the accommodations necessary to service the anticipated trade expansion. The success of these ventures will depend upon the political makeup of the post-war world.

While shipping will have an important role to play in this expansion, it is nevertheless too early for shipowners to make specific plans. They can, however, in accordance with the declared purpose of the Merchant Marine Act of 1936 that shipping be privately owned and operated, help in the development of sound policies which will encourage and promote a merchant fleet suitable to the nation's needs. Meanwhile, the data covering the cost of new tonnage, estimates of potential foreign and domestic cargoes, estimates of revenues and operating costs and information concerning international agreements which are available to the governmental bureaus, should be made available to shipowners in such form as will aid them in their plans.

It has been estimated that we shall have some 30,000,000 deadweight tons of dry cargo freighters at the war's end, approximately four times the pre-war tonnage. This large fleet, neverthless, is a wartime fleet. The vessels make a satisfactory life-line to our troops abroad and to



EDWARD P. FARLEY

A-H

our Allies. However, the fleet is not a commercial fleet which will fully meet peacetime needs, and will require supplementing by construction of specialized units.

The United States is building merchant ships for war, while the British are concentrating their efforts on naval vessels. This avoids a loss of man power and resources in each country and makes possible the achievement of maximum productivity for the United Nations through the application of the principle of specialization. Nevertheless, the pursuit of that policy is creating a complex problem for post-war shipping. For it is clear that additional tonnage will be added to the world's merchant fleets after the war, not only because the United States must balance its merchant marine, but because other maritime nations, particularly Britain and France, will wish to reconstitute their depleted fleets.

With the outlook for an ur balanced United States fleet and fc an increase in world tonnage or i equivalent, shipowners must view th future with level heads. Will even follow the pattern established in th years after World War I? Wi world shipping, in particular, pro per while the more fortunate cour tries supply the war-ravaged are: in Europe and Asia, and while othe nations build their post-war me: chant marines? Will world shippin subsequently suffer from low rate and high costs when the first flus of trade has ceased? These ar questions which shipowners mus ask themselves and try to answe before making substantial con mitments.

As the future cannot be predicte with any degree of certainty, esp cially when the economic an political skeleton of the post-wa world at home and abroad is not : all clear, the events which followe World War I may provide man fruitful ideas with which to prepar for the years to come. The study c previous experience, however, mu be approached with caution.

During and immediately after th last war, the United States cor structed a merchant fleet which, b 1920, was 23 per cent of all vesse 100 gross tons and over. Only Gre: Britain, with 33.6 per cent, exceede that amount. Moreover, the world fleets were balanced because ever nation except Germany ended th war with more ships than they ha in 1914. The accumulation of th vast tonnage was accompanied by great wave of optimism in the bus ness world. Trade among all natior

Pacific World Trade

ould expand, it was said, to unrecedented levels. Unfortunately, he increase in world shipping apacity was not accompanied by he anticipated growth in world rade. In fact, according to the conomic Intelligence Service of the eague of Nations, during 1920 and 921 the total volume of world rade was approximately 24 per cent ss than that of 1913. The approxnate 30 per cent increase in world onnage and the approximate 24 per ent decrease in world trade precipiated a collapse of shipping rates and alues.

The slump was not immediately pparent because the United States hipping Board indicated, in its eport for June 30, 1920, that the oard's managing agents, by conference agreements providing for he operation of Board vessels, had tablished "—complete stabilization f rates in some trades and a large easure of stabilization in practically all trades—." One year later, owever, on June 30, 1921, the oard reported: "During the year tes declined from 50 to 60 per nt—. Under such conditions very w ships were operating at a profit y the end of the fiscal year."

This decline in rates is frequently tributed to the utilization of an xcessive" amount of tonnage. Exssive tonnage, it is said, results in uinous" competition and retards he development of an "adequate" placement program. Such an interetation of the events is dangerous, pecially when used in the formulaon of a policy to guide the shipping dustry through the uncertain days ead. What is an "excessive" mount of tonnage? What is "ruinus" competition? What are dequate" replacements? What is ong-range planning"? These questons must be answered by the policy e adopt.

To illustrate, suppose that one undred vessels totaling 900,000 eadweight tons and with a given ggregate bale cubic, could carry, hen loaded to capacity, the total olume of intercoastal trade during ny one year. Is one hundred and o vessels an "excessive" number? ninety-eight a "deficient" supply? o reasonable person would answer e questions, for the answers are ot capable of quantitative expreson. The terms "excessive tonnage," uinous competition," and "adeuate replacements" may be used guely to describe a general business condition, but they may not be used as an administrative creed.

The term "long-range planning" also has a pleasant sound, but essentially it consists of guesses. If those who do the guessing guess right, planning can be profitable. In fact, planning is involved in the considerations on which any investment is based. Nevertheless, no single set of plans can be used in daily administration because the factors on which the "guess" is based are constantly subject to change. Today's plans may be like today's calendar; they will be of little use next year. In the early 1930's, the Pennsylvania Railroad electrified its road from New York to Washington, and the Rockefeller interests built Rockefeller Center. These long-range plans have been profitable. On the other hand, other railroads and other builders made huge investments in the late 1920's, in what they thought was long-range planning, and these roads and builders either suffered losses or are today in bankruptcy.

The amount of tonnage which may be profitably employed in any trade during any period of time will vary, among other things, with the level of rates and the volume of cargo offerings. But, the latter two are neither fixed nor independent of each other. The experience of inter-coastal shipping companies during the 1920's affords a good illustration of the fact that a reduction in rates will increase the volume of cargo offerings. In the midst of "rate wars" lines that had previously considered western Pennsylvania as the boundary of their "traffic shed" suddenly found cargo coming from as far west as Chicago. The measure of "excess" tonnage unexpectedly changed, and it is not surprising to find that, in some cases, a "superfluous" total suddenly became a "deficient" supply.

Private owners, investing for profits, construct and operate on a basis of anticipated revenues and costs. At the time they make their investment, they cannot know for certain how much to construct and operate so as to assure themselves of a profit. The amount of tonnage in a trade may be consciously regulated, but it cannot be regulated in relation to any scale that will indicate clearly that the number of ships or their cargo-carrying capacity has become "excessive." Investors after World War II, like investors after World War I, will anticipate revenues and costs, and if they overanticipate the results as they did in 1918-1919, there is nothing to do, once the investment is made, but to take the losses and start afresh.

The American-Hawaiian Steamship Company has had substantial experience in the Pacific trades. Indeed, the predecessor companies of American-Hawaiian operated in the Pacific until American-Hawaiian was organized in 1898. Much of the early direction of the American-Hawaiian came from California shipping men. Officers and stockholders have come from all parts of the Pacific Coast since its incorporation. The company would look with favor on an opportunity to make practical use of this wealth of experience in the Pacific, and will do so providing political and economic conditions are sufficiently clear to justify the belief that a reasonable possibility exists for successful operations.

Pacific WORLD TRADE

Brief History of the American-Hawaiian Steamship Company

Does the Past Proclaim the Future?

In 1855 the founders of the American-Hawaiian Steamship Company, "to adequately supply the needs of California merchants in catering to the needs of the enormous new population that came with the '49 gold rush," brought into being the California fleet of Clipper Ships, giving a Coast-to-Coast service around Cape Horn, and later the Hawaiian line between San Francisco and the Hawaiian Islands. The Clipper Serv-

ice continued, with such outstanding performances as those of the "Sovereign of the Seas," New York to San Francisco in 103 days; "Glory of the Seas," New York to San Francisco in 96 days; "Flying Cloud," "Andrew Jackson," "Flying Fish" and "Sword Fish," New York to San Francisco, 89 to 92 days. There were many such ships, varying in tonnage from 1800 to 4900 dwt. The sailing-ship service continued to the end of the century.

In 1899 the American-Hawaiian Steamship Company was incorporated, succeeding Dearborn & Company and Flint & Company with Flint and Dearborn handling the Eastern end and Williams Dimond & Company the Pacific end. Steamer service was inaugurated via the Straits of Magellan, and shortly afterward such well-known steamer names as "Alaskan," "Nebraskan" and "Texan" appeared on the run. The "Texan," dating from 1902, was torpedoed early in the present war, and the "Mexican," dating from 1907, is still in operation.

In 1907 the fleet was divided into Atlantic and Pacific units, with transshipment service across the Isthmus of Tehauntepec. The Lapham name first appears in the history when Lewis H. Lapham purchased Charles R. Flint's interest and the



W. DEARBORN CLARK
Vice-president and traffic manager, American-Hawaiian Steamship Co.

General Agents at New York became Dearborn & Lapham.

In 1914 the "Missourian" made our first westbound transit of the Panama Canal. In 1917 the Federal Government requisitioned most of the company's ships, which were returned to the company in 1919. 1917 also saw the end of the service to Hawaii. In 1923 the head office of the company was moved from New York to San Francisco.

In 1928, jointly with Matson Navigation Company, American-Hawaiian purchased 21 ships from the Government and organized the Oceanic and Oriental Navigation Company with American-Hawaiian as Managing Agents of the Oriental Service and Matson for the Oceanic Service.

In 1929 the 7 vessels of the Williams Line were purchased and the Williams Steamship Corp. was organized. This set-up continued until the end of 1937, when the Oceanic and Oriental Line was dissolved and the American-Hawaiian continued in the intercoastal service.

George S. Dearborn was president of the company from 1899 to 1920 Henry Dearborn from 1920 to 1923 Cary W. Cook from 1923 to 1925 Roger D. Lapham from 1925 to 1937 and John E. Cushing from 1937 to date. When Roger Lapham resigned as president, he became Chairman of the Board, where he continued until elected Mayor of San Francisco in 1943, at which time Edward P. Farley, who had been Chairman of the Executive Committee since 1928 became Chairman of the Board.

In charge of traffic operation since 1935 is W. Dearborn Clark who has also been vice president since 1938. President Cushing has been on leave to the War Shipping Administration since the beginning of the war and Vice President Thomas G. Plant is in the Army.

Brazil's First College of Chemical Engineering

Sao Paulo, commercial and industrial capital of Brazil, will soon have the first school of chemical engineering in the republic. The new institution, when completed, will combine with the existing School of Business Administration and School of Technical Drawing in that city to form the Technical University of Sao Paulo.

"The empire of the Mediterranean is of the past, that of the Atlantic is on the wane and the empire of the future is in the Pacific."—Theo. Roosevelt.

S.S. Mexicon. Dating from 1907, the "Mexican" is one of the oldest ships in service.



Passengers Are World Trade

While it is true that every dollar's worth of exports must be paid for by imports from other countries, there are certain well-known items that help make up the total of exchange, and a major item in this total is the money spent by American travelers in foreign countries.

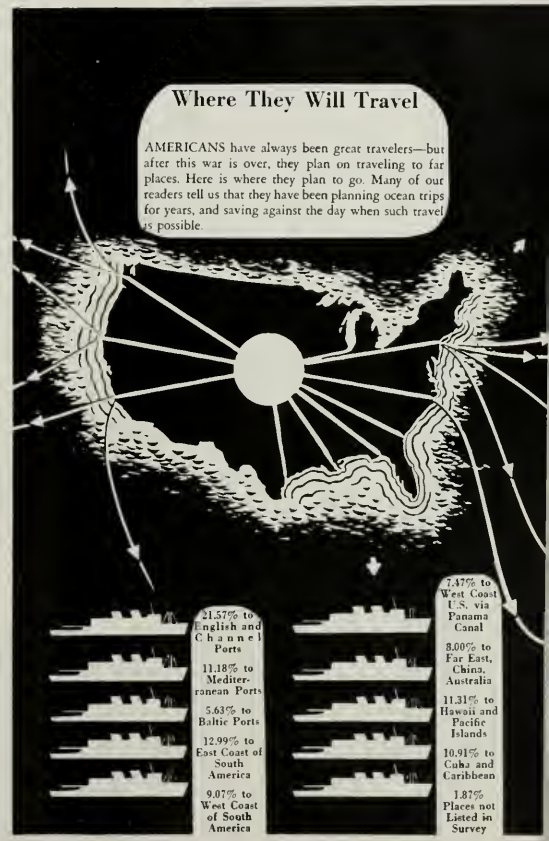
All travelers do not spend on an equal basis. Some are tourists who may, or may not, spend freely as they visit other countries. Some travel for business purposes, and the amount they spend varies also. Other travelers may be aliens going home, or workers going to distant jobs. It has been estimated, however, that for every dollar spent for travel, there are three dollars spent abroad.

F. H. Crozier of the Civil Aeronautics Board, in a recent study, estimated gross passenger steamship revenues for 1938 on all lines in all areas at $129,700,000. Of this total, Americans traveling on American ships spent $22,600,000 and Americans traveling on foreign ships spent $68,000,000, or a total of $90,600,000. The fact was brought out that foreign lines carried 70 per cent of American passenger traffic and that American vessels carried only about one-quarter of the total traffic. These figures extended in another direction indicate that Americans abroad spent some quarter of a billion dollars in foreign countries, in addition to the amounts spent abroad for ship operations and in addition to the amount spent for fares. It is safe to assume that most of American travel in the post-war years will be on American ships, for the principal foreign lines heretofore used included German, Italian, French and Japanese.

An interesting aside on the Crozier figures is that of **all** passenger travelers, about two-thirds were American residents.

The accompanying chart, furnished by "Ships" magazine, discloses an interesting distribution of post-war traffic. These figures represent the replies to a questionnaire sent to readers of the magazine in 24 classifications, including newspaper and magazine editors, radio commentators, columnists, librarians, clergymen, college and high school faculty, heads of service clubs, bankers, trade association executives, chamber of

(Continued on page 98)



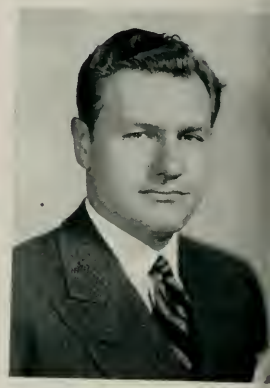
TOURISTS ARE BIG BUSINESS



ARGENTINA

A WORLD LEADER IN MANY PRODUCTS





NELSON W. ROCKEFELLER
Assistant Secretary of State; former Co-ordinator, Inter-American Affairs.

Many inquiries reach us about the importance and the future of trade between the United States and Argentina —more inquiries than about any other of our potential markets except China. This article will deal only with the commercial side of the picture.—Ed.

When Nelson W. Rockefeller was advanced recently from Coordinator of Inter-American Affairs to Assistant Secretary of State, it was generally assumed in the shipping world that the political difficulties relating to Argentina would be one of his first problems, and that they would be solved, "to the mutual interests of all," to use his own words in the hearing before the Senate Committee.

As one of the most important countries in the world from a business standpoint, the country is bound to be influential in the affairs of the Americas, and of Europe.

Contrary to some opinions, shipping to Argentina has not stopped. There are some 12 or 15 sailings per month from New Orleans to Buenos Aires, and the ships of many countries conduct 2- or 3-way trade. During the first ten months of last year the number of ships, by flag, and the

Pacific WORLD TRADE



MARTIN LUIS ERAGO
Consul of Argentina at San Francisco.

et registered tonnage reaching the
rious ports of Argentina, were as
ollows:

	No. of Ships	Tons
ritish	215	983,766
rgentine	493	523,191
panish	96	273,853
wedish	121	247,461
merican	50	215,648
razilian	90	190,522
lorwegian	23	65,970
hilean	29	64,144
reek	19	57,643
ther countries	105	204,502
Totals	1,241	2,826,700

uring the same period of 1943,
,096 ships with a tonage of 2,301,-
12 tons arrived at Argentine ports.

Argentina is a country with many
rong social forces at work within
, mostly of European origin. It has
een called the most European of
merican countries. Although speak-
ng the Spanish language officially,
lly one-fourth of the population is
f Italian origin, while the social life
nd ways are more closely linked
ith the French. Unlike the moun-
inous Western countries of South
merica, there is very little of the
ndian, or original native strain, to
e found in the present population.

Although European in influence,
nd although in the early days of Ar-
ntine civilization Spain controlled
ie seas, the culture and commerce
f Europe did not reach the country
rectly across the Atlantic but
rough the northern gateways of
Colombia and Peru and to a considerable extent through Chile on the Pacific. Under Spain's navigation laws of the period, trade directly across the Atlantic was forbidden to Argentina. For 200 years the hides, tallow and other products of the almost limitless "pampas" legally had to go by mule back across the Andes through Peru and Colombia and up the Pacific Coast to the Isthmus of Panama, across that neck of land by mule back again and so by ship to Spain. Merchandise in exchange came back the same hard way.

This system encouraged illicit trade in wild cattle and hides, and that was the origin of the "gaucho"—outlaw.

The Portuguese, who in 1680 had established themselves across the river from Buenos Aires, probably influenced the Spanish to eventually set up, in 1776, the Vice-royalty of Rio de la Plata, which included Argentina, Paraguay, Uruguay and part of Bolivia. In 1810 Argentina declared its independence of Spain and in 1816 a republic was founded. Kaleidoscopic revolutions followed through many years, with the influences of the cattle interests and those of the city dwellers in constant opposition. Because the nation lives by its cattle business and other agricultural produce, the cattle interests are usually directly or indirectly in control, and because the country is now a world leader in many products, some of which are very important, the future of Argentina must be recognized in a world in which international

Plaza Hotel, Buenos Aires.





E. GEORGE DAVIS
Manager, Argentine Trade Promotion Corporation.

trade is bound to be a dominating influence for prosperity and for peace.

Geographically, Argentina has everything—great grassy plains, wide navigable rivers, limitless grazing plateaus, regions verdant with tropical growth, lakes, and majestic mountains of unsurpassed beauty. Lying almost entirely in the temperate zone, the climate is slightly milder than that of the United States, but with the seasons reversed. From a commercial standpoint this latter fact is important because the products of Northern and Southern hemispheres are interchangeable during the off seasons, to the benefit of both regions.

Although neutral in the war, the products of Argentina have been very useful in supplying the United Nations' armies. Meat to Great Britain, wool and hides to the United States, have been important factors in maintaining the wartime economy. Probably without Argentine meat, Britain could not have lived.

Figures provided by the Coordinator of Inter-American Affairs indicate that 75 per cent of the world total of chilled beef comes from Argentina and about 75 per cent of the world's linseed oil. Many important metals, including tungsten and copper, have played a vital part in the armament program.

On the import side, Argentina draws very heavily on the United States for machinery, farm equipment, automobiles and textiles. A compilation of the import and ex-

Pacific WORLD TRADE

port values between Argentina and the rest of the world, taken from the book "Argentine Riddle," by Felix J. Weil, shows the following:

EXPORT

Average	British Empire	United States	Brazil	Other American Countries	Sweden	Other Countries	Total
1937/39	577	221	86	62	30	781	1,757
1941	553	562	83	138	16	181	1,533
1942	689	492	102	220	72	115	1,690
1943	894	498	138	323	60	143	2,056
				IMPORT			
1937/39	371	284	51	90	27	584	1,407
1941	314	370	123	169	22	88	1,086
1942	264	329	190	142	81	60	1,066
1943	222	150	169	123	83	52	799

In millions of paper pesos, at about 26 cents. These figures are not strictly comparable with those shown in the official statistics (Anuario del Comercio Exterior) because the Central Bank adjusted some values and added loading costs to the export values in order to get f.o.b. values.

The Coordinator recently listed the types of machinery equipment which will be required during the next ten years by various American countries, and this list shows Argentina requiring, for new plant capacity and replacements, a total of $645,000,000. Argentina is in third place among 20 countries and is exceeded only by Brazil and Mexico.

Established in 1941 for the purpose of developing markets for Argentine products in order to obtain exchange for the purchase of importations, the Argentine Trade Promotion Corporation was established with capital subscribed by 92 import and export firms. Included in its board of directors are the managing director of General Electric Argentine subsidiary, the managing director of General Motors Argentine plant, the managing director of the Moore McCormack lines (in Argentina), the manager of the First National Bank of Boston (in Argentina), and the managing director of the Ford Motor Company (Argentina).

Mardi Gras sign thirty stories high, Buenos Aires.



Originally operating in the United States from New York, the corporation has since opened sub-offices at New Orleans, Chicago and San Francisco. The Pacific Coast affairs are handled from the San Francisco office, where the manager, E. G. Davis, keeps the eye of the West fixed on the post-war days when it can be reasonably estimated that in the course of the first ten years Argentina can spend over 1,000 million dollars in the American market.

During the war, when shipments to Argentina have been very limited but exports from the country have been great, it is estimated that by the end of this year an exchange balance of 1 billion dollars will have been accumulated for post-war imports. A little-realized feature of the world war economy is that Argentina also has a "lend-lease" program with England. It is a credit deal requiring post-war payment in cash, or commodities.

Argentina is a market for Americans to watch closely.



Street scene, Buenos Aires.

"U. S. Shipping in Transpacific Trade"

A Timely Book

In a study which surveys commodity movements, shipping services, trades routes, international competition and national policies Walter A. Radius has written a book entitled "United States Shipping in Trans-Pacific Trade," which should find ready acceptance by the shipping and foreign trade industries especially on the Pacific Coast. It has just been published by the Stanford University Press.

Dealing with the period from 1922 to 1938, the author analizes the strength and weaknesses of the various lines operating in the Pacific, the flow of traffic in certain trade routes, and suggests methods for avoiding difficulties and failures of the past. The subsidy program is given considerable attention, as is the entire merchant marine policy of the Government, and since it is understood that Mr. Radius is to be connected with the new Shipping Division in the reorganized State Department, his opinions may be translated into practical action. The book is the culmination of a study of shipping problems initiated under the auspices of the American Council, Institute of Pacific Relations with which the author was associated under a Rockefeller Foundation Fellowship.

Testifying to the value of hither

(Continued on page 103)

Packing and Handling of Air Cargo

Many a drawing intended to show the loading of cargo planes carries a very misleading implication. It is not unusual for such drawings to show great stacks of heavy wooden crates and boxes, barrels and bales, awaiting shipment by air. It will be noted that pictures of the cargo-carrying airlines are careful to show small packages lightly packed.

This illustrates a common misconception of packing requirements for air transport. While surface freight carriers require substantial construction that will withstand days or weeks of rough handling, as well as protection against climatic and temperature changes, the requirements for air cargo are almost the reverse. Containers should be as light as possible and as small as it is convenient to make them. They should be light because the capacity of the plane is limited and the rate per pound is high. There are practically no "commodity rates" on the air lines, nearly all classes of material together with their packing taking the same rate. It is possible to permit light packing because the cargo in a plane is securely fastened to the walls or floor; it does not get the endless jolting that it does by train or truck; it does not have to carry the heavy load or pressure above and around it; the flight is of such short duration that temperature changes matter little, and as a rule the contents of the packages are light.

The packing units should be as small as possible because the cargo doors of the plane are small, and also because when space is scarce, many small units can be accommodated where a few large ones could not be.

In these war days most of the air cargo is handled by the Army, and at principal dispatching points crews of expert packing engineers are constantly engaged in reducing the package weights without endangering content. They examine all shipments, and wherever possible substitute light containers for the previous weight- and space-consuming wooden boxes and crates. Their average saving in weight of air shipments is around 29 per cent.

Consideration must be given, of course, to the haul beyond the air destination. If there is a further train or truck or steamer trip, the goods must be packed for it, or repacked at the end of the plane trip.

Air Cargo Is Limited

There is a popular idea that with the number of commercial and military planes in the air, there is, or will be after the war, a very great inroad to surface carrier freight, but such is not the case.

Practically the only goods that will, in the foreseeable future, be carried by air are either those that are now carried as express, parcel post or less-than-carload freight, or those that would not otherwise have been carried at all. It is probable that the latter group, which includes emergency materials, medicines, seeds, flowers, and style items, will offset the loss to the surface carriers of existing l.c.l. volume.

In the last normal year, the surface traffic in the United States amounted to just about 700 billion ton-miles. This total was made up about as follows:

	Billion ton-miles
Steam railroads	477
Great Lakes	95
Trucks	44
Pipelines	60
Inland waterways	21
Railway express (rail)	2¼
Parcel Post	4/5

About the only items that will be affected by air transportation are the last two in the above tabulation, plus some l.c.l. freight; but l.c.l. freight amounted to a total of only 1½ per cent of all the rail freight in the country. This is another fact that is little understood. 98½ per cent is shipped in carload quantities, and it is unlikely that the freight rate which averages less than 1 cent per ton-mile, will ever be approached by the airlines. That is to say that it is extremely unlikely that any airline can ever carry a ton of freight for a mile for 1 cent. And the rail rate usually includes pick-up and delivery.

It would seem that railroad, truck, pipeline and waterway freight traffic would be safe from serious air competition for a long while.

Commodity Groupings by Air

It is often said that almost anything, or everything, is being carried by plane, including farm and orchard products. There are some of the latter, and there will be more. Experiments now in process point in that direction.

But in one of our last normal months, here is what was shipped by air:

	Aver. weight lbs.	Percentage of shipments
Machinery and Hardware	10	23.26
Printed Matter	13.6	15.11
Store Merchandise	5	13.39
Motion Picture Film	9.5	4.32
Electrotypes	4.2	6.11



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Cut Flowers	5	3.63
Valuables	3.8	8.25
News Photos	1.3	4.42
Drugs	5.4	1.46
Records & Radio Parts	3.3	4.53
Freight Manifests	2.7	4.36
Liquor	5.1	.30
Miscellaneous	6.	2.44
Food & Raw Samples	4.2	1.78
Optical Goods & Cameras	4.5	1.85
Personal Baggage	15.1	2.19
Total	7.3	

What Can or Cannot Be Shipped by Air

The airlines will take almost anything that is acceptable by rail, provided that the weight and space limitations are kept in mind. The few forbidden articles include explosives, inflammables, some acids, radium, radioactive or magnetic materials (unless specially planned in advance), motion picture film not specially packed, and most live animals. Certain "inoffensive, non-odorous" animals will be acceptable "when securely packed." For those who might have them to ship, the list of permitted animals includes horned toads, newts, salamanders and chameleons.

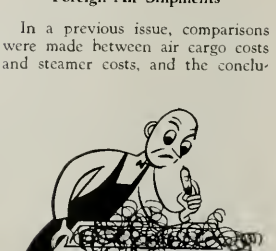
Effect of Temperature Changes

Even though the distance between origin and destination may be short and the climate known to be similar at both ends of the trip, the height at which the planes fly may have the effect of a radical climatic variation. Cut flowers, fresh vegetables and certain liquids would be in danger of freezing at certain altitudes unless properly protected. Corrugated board is the best insulation against sudden temperature changes, and it is well for the shipper to confer with the local airline or express agent in order to make certain that the shipment is "dressed" for the trip. In addition to the temperature, the pressure is important. The gradually lowering pressure at the high altitudes and packing methods become as important as the goods themselves.

On domestic shipments and on most foreign shipments the rules of the Railway Express Agency must be adhered to, for they pick up and deliver for the airlines. The first rule of packing in the Express Tariff reads simply, "All property shall be so prepared or packed as to insure safe transportation with ordinary care and handling." The carrier is not responsible for loss, damage or delay caused by improper or insufficient packing. With the risk laid definitely on the shoulders of the shipper (or consignee), it becomes the part of discretion to follow carefully the rules in the express classification. They outline all packing requirements for all ordinary classes and types of cargo.

Foreign Air Shipments

In a previous issue, comparisons were made between air cargo costs and steamer costs, and the conclusion was reached that entirely apart from the tremendous differences, there was the undisputed fact that transocean cargo carriers by air would require more surface ships to carry gasoline for the planes than the original cargo would have required.



Packing for overseas operations should be about the same as for domestic operations, with the added provision of methods for protecting certain commodities against salt air. The hop is so short in point of time, however, that the number of articles subject to such damage is very small. Here again the transportation agent should be consulted on initial shipments. There is the added factor of extreme heat that will be encountered on all shipping to tropical countries and to those that are reached by crossing the equator.



Fiber containers, corrugated and solid, many experts believe, will figure prominently in post-war air transport.

Plywood as a container material has received considerable attention and after the war promises to loom importantly in air package consideration by virtue of its light weight and strength.

In the field of metals, a new thin-walled aluminum container capable of hermetic sealing when necessary and adapted for the use of the food and pharmaceutical industries bids fair to find great favor after the war. Intended primarily for the transport of dehydrated soups and juices, cheese, condiments and pharmaceuticals, its principal advantage lies in economy of weight.

As in other directions, the war has exerted tremendous influence and the rise in air borne tonnage has led to developments which will directly bear upon post-war packaging.

Passengers Are World Trade

(Continued from page 93)

commerce officials, writers and men and women in almost every walk of life. While possibly weighted in the interest of ocean travel, the figures on air travel still appear to be significant. 80.64 per cent plan to travel by ships exclusively. 12.84 per cent expressed a preference for a combination trip using both ships and planes. Only 6.52 per cent say they will travel both ways by air.

An uncalculable factor in future travel is the influence of changed control of the Pacific Islands, and the effect of American armies stationed in nearly every part of the world, and the greater knowledge of world affairs and America in particular on the part of the peoples of those lands.

Rail Freight Rates

And Their Relation to Foreign Trade

By Howard G. Freas
Rate Expert
California State Railroad Commission

The strategic location of our ports
e the Pacific Coast is, as a general
roposition, conceded. Our excellent
rbors and other transshipment fa-
ities, and their importance in ac-
erating the movement of cargo
und for or coming from distant
ores, have for many years been rec-
nized as a great asset in the devel-
ment of our foreign trade. These
vantages have within recent
nths been brought out even more
minently by reason of the un-
recedented handling of men, mate-
ls and supplies to the far-flung
ttle areas in the Pacific.

There are those who anticipate
at with the termination of hostili-
s and the elevation of living stand-
ds in the Orient the growth of our
mmerce through the Pacific ports
ay reach proportions that will chal-
nge the supremacy of the great
rts on the Atlantic Coast. How-
er pleasant as it may be compla-
ently to dream of the things we hope
r, a survey of the situation seems
nely. Are we doing as well as we
ink we are? If not, wherein lie our
ortcomings?

Competition Between the Ports

The traffic between United States
cific ports and Europe, South
merica and Africa consists largely
commodities produced in one of
ese areas and consumed in the
her. Exports of dried fruit, canned
ods and other foodstuffs, lumber
d newsprint paper, and imports of
n-metallic minerals, manufactured
icles and coffee, are outstanding
amples. During the pre-war years,
e preponderance of this tonnage
oved through Pacific ports. Owing
its general nature, the movement
a substantial volume of this traffic
the future via the overland route
d Atlantic or Gulf ports does not
em probable. Therefore, from a
rt competitive standpoint, there
es not appear to be any great im-
diment to the resumption and
eater development of our com-
erce in these trades as soon as con-
tions permit.

The situation surrounding the ex-



HOWARD G. FREAS

pansion of commerce with the Hawaiian Islands and the other countries across the Pacific, however, is entirely different. As a whole these countries do not engage in manufacturing to any large extent. They need manufactured articles of various kinds on the one hand and an outlet for the many raw materials which they produce on the other.

While the Pacific Coast states will no doubt improve their position as an industrial area in the post-war years, this country's principal manufacturing activities have been and still are centered in the states east of the Mississippi River and north of the Ohio and Potomac Rivers.[1] The greatest density of population and most of our expendable wealth are found in this northeastern portion of the country.

For these reasons it is safe to predict that the northeast will for many years to come, continue in first position as the principal market in the United States for raw materials imported from the Pacific and as the producing area for most of the manufactured articles exported from this country. The extent of the Pacific Coast's ability to expand its transpacific commerce will, therefore, depend in large measure upon the competitive position which the Pacific Coast can attain in relation to the ports located on the Atlantic Seaboard and on the Gulf of Mexico. Moreover, the future expansion of manufacturing and allied pursuits in the countries across the Pacific, and the competition encountered by American articles with those produced locally and in Europe, will become important factors.

Of course, Pacific Coast ports have an advantageous location with respect to transpacific traffic. This is true not only with respect to our inland cities but also with respect to other United States ports. Surface trade routes from our Pacific ports are shorter than from our Atlantic and Gulf ports. Moreover, the distance between the large producing and consuming centers in the northeastern part of the United States and the ports across the Pacific is shorter via the Pacific Coast ports than by way of the Atlantic and Gulf ports.

Here, however, there is danger of being complacent and of overestimating our advantages. Considering the lengths of the hauls involved, the differences in distances are not great, and the additional time involved is frequently offset by lower through transportation costs. The importance of future air traffic must also be considered. In that field all cities are port cities and distances from inland cities to transpacific points are frequently less than those from port cities which are intermediate via surface routes.

An analysis of the water-borne commerce between various transpacific ports and the principal United States ports is timely. For this purpose, certain statistics appearing in Report No. 42-37, issued by the United States Maritime Commission for the fiscal year ended June 30, 1937, will be referred to. This report shows the port-to-port movement of foreign commerce for the latest period for which records have been released. This happens to be the last 12-month period before the situation in Europe became a serious menace to commercial intercourse between the nations of the world. The specific figures to which reference is made appear in the accompanying table. They vividly disclose

1. In 1939, the value of manufactured articles produced in the area mentioned amounted to approximately 70 per cent of the total value of all manufactured articles produced in the United States.

Pacific WORLD TRADE

the competition with which the Pacific Coast is confronted.

It will be noted that of the total imports from the Philippines only 25 per cent moved via the principal Pacific ports. The imports from the Malay States—East Indies and India—reaching the Pacific ports amounted to only 9 per cent of the tonnage imported from those countries into the United States. The Pacific Coast ports' share of the imports from Australia amounted to only 16 per cent. Imports from China and Japan handled through the Pacific ports amounted to 39 and 42 per cent, respectively, of the total importations from those countries. Of the total imports received in the United States from the representative ports in all of the countries mentioned, only 22 per cent moved through the Pacific Coast.

Due to the large production of petroleum products, lumber, paper stock and its manufactures on the Pacific Coast, and the extensive exportation of these commodities, it is obvious that a comparison of the total exports, by port areas, would not be informative of the competitive picture with respect to export traffic. For this reason such commodities should be excluded from consideration here. Similarly, the large but temporary movement of scrap iron to Japan should not enter into this analysis. Of the remaining exports the following percentages moved through the principal Pacific ports:

Philippines	35%
China	20%
Japan	18%
Australia	13%
Malay States—East Indies	12%
India	22%

Considerable Hawaiian traffic has also shipped away from the Pacific Coast ports. For several years prior to the time the steamship lines began to feel the impact of the disturbed conditions in Europe, the Atlantic and gulf ports handled about 25 per cent of the traffic shipped from the mainland to the Islands, excluding cargo such as lumber, petroleum and petroleum products. During the same years approximately 30 per cent of the traffic from the Islands to the mainland moved to Atlantic and Gulf ports. The influence of this competition has been felt on traffic originating in Hawaii destined to inland points as far west as Chicago, considerable tonnage having moved either to North Atlantic ports, thence via the Hudson River, Erie Canal, and the Great Lakes, or to New Orleans, thence via the Mississippi and Illinois Rivers.[2]

In the light of these conditions, the necessity for devoting efforts to the construction and maintenance of facilities for quick handling of cargo, and having available modern, fast vessels in the several trades, with frequent sailings, is very apparent. A progressive rate-making policy by the steamship lines serving our ports is likewise essential. Of extreme importance also is the adjustment of import and export rates maintained by the transcontinental railroads. This is generally recognized. Yet strange as it may seem, the future enjoyment of these rates has been in jeopardy for the last five years and very little has been said upon the subject.

Competitive Opportunities Threatened

Since the decision of the United States Supreme Court in the **Import Rate Case**[3] in 1896, the right of rail carriers to maintain lower rates on import and export traffic, provided the difference is reasonable and not unreasonably necessary, has been re-

2. See, for example, report of Interstate Commerce Commission in *Canned Pineapples to Chicago and Milwaukee*, 235 I.C.C. 557.
3. 162 U. S. 197.

COMPARATIVE IMPORT AND EXPORT TONNAGE TRANSPORTED BETWEEN PRINCIPAL PORTS OF THE UNITED STATES, BY AREAS, AND REPRESENTATIVE PORTS IN THE COUNTRIES INDICATED: FISCAL YEAR ENDED JUNE 30, 1937

(Figures are in tons of 2,240 pounds)

Country	Principal Ports, By Areas: Atlantic[1]	Gulf[2]	Pacific[3]	All United States Ports
Imports				
Philippine Islands [a]	503,239	119,941	219,805	848,981
China [b]	130,547	4,285	89,429	224,291
Japan [c]	289,087	4,175	218,688	514,731
Australia [d]	60,423	50	13,752	74,225
Malay States - East Indies [e]	604,136	48,704	68,266	726,646
India [f]	452,274	95,631	52,338	613,119
Exports, Excluding Petroleum Products, Paper Stock and Manufactures Thereof and Lumber (As well as Scrap Iron Destined to Japan)				
Philippine Islands [a]	197,154	1,518	111,409	312,601
China [b]	205,971	15,723	57,784	281,074
Japan [c]	351,015	236,945	180,985	984,626
Australia [d]	78,501	18,316	18,196	137,725
Malay States - East Indies [e]	73,263	5,130	11,136	91,332
India [f]	41,065	5,446	12,046	59,141

[a] Philippine Is. include: Manila, Iloilo, Cebu

[b] China includes: Shanghai, Hongkong

[c] Japan includes: Yokohama, Kobe

[d] Australia includes: Sydney, Melbourne, Brisbane, Adelaide

[e] Malay States-East Indies includes: Batavia, Java; Soerbaja, " ; Belawan, Sumatra; Singapore, Malay St.

[f] India includes: Calcutta, Bombay

1 Atlantic Ports include: Baltimore, Boston, Newport News, New York, Norfolk, Philadelphia, Savannah, Ga., Wilmington, N.C.

2 Gulf Ports include: Corpus Christis, Galveston, Houston, Mobile, New Orleans

3 Pacific Ports include: Los Angeles, Portland, San Francisco, Seattle, Tacoma

Source of data: Report No. 42 issued by U.S. Maritime Commission, Division of Research.

gatedly recognized.[4] Prior to 1906 r! lines were permitted to publish trough rates between points within te United States and ports or places i foreign countries. In subsequent ears, however, it has been required tat the rates for the inland haul be eplicitly stated and added to the gean rates. It has been and still is te custom to make import and ex- rt rail rates according to the needs e the carriers and ports for increased tffic, to enable carriers and ports t compete with each other, and to eet shippers' requirements. Port valry is more intense in foreign ade than in domestic commerce, fe all of the larger ports compete the import and export trades for te traffic from the great interior oducing and consuming areas. As esult the import and export rates dinarily bear no relation to the in- hd rates on domestic traffic. The lterstate Commerce Commission has cognized that they are influenced l entirely different conditions and tat their reasonableness is frequent- l governed by considerations which te unrelated to and have no bear- g upon the reasonableness per se domestic rates.[5]

Although efforts are made to equal- e through transportation costs, the gree of equalization accomplished by no means complete, nor is the lationship of the costs via the sev- al ports strictly maintained. Fluctu- ions in ocean rates also tend to dis- rb these adjustments. In this con- ction, it should be remembered that e ocean carriers engaged in the At- ntic-Orient or Australia trade pre- mptively have a greater latitude in ljusting their rates to meet competi- on than those operating out of Pa- fic Coast ports, due to the greater onomy attainable on account of eir longer haul.

Consequently, it is not surprising find that, in the making of trans- ntinental import and export rates, ie element of distance within the nited States is entirely disregarded. he same rates apply to or from all the North Pacific as well as South cific ports. In many cases, these tes vary with the country from hich the traffic is imported or to hich it is exported. In our own untry, in order to enable both the rth coast and south coast lines to mpete with the North and South tlantic and Gulf ports and the rail es which serve them, the same te frequently applies from or to virtually the entire territory east of the Rocky Mountains.

There has, however, been a general tendency to restrict the latitude of the rail carriers in making import and export rates in disregard of the domestic rate level. The contention has been made that low import and export rates tend to cast an undue burden upon domestic traffic and result in undue prejudice against shippers interested in traffic moving wholly within the United States. Thus, in permitting the rail lines serving the Gulf to establish import and export rates with relation to those applicable between the interior and North Atlantic ports, the Interstate Commerce Commission in 1930 subjected such authority to the condition, among others, that no import or export rates be established less than 65 per cent of the domestic rates for the distance between the port and the interior point involved.[6] More recently, the same Commission found that certain domestic vegetable oil rates were un-



duly prejudicial to the extent that they exceeded the rates on imported vegetable oils from the same ports to the same destinations.[7]

Instances such as those mentioned merit close attention on the part of Pacific Coast shipping interests. However, a more serious threat to the establishment of import and export rates calculated to foster the movement of foreign trade through the Pacific Coast will have to be met. Certain interests in the southern states, being dissatisfied with their land freight rates, introduced through their representatives in Congress in 1939 several bills for the purpose of establishing a so-called uniform basis of rail rates. Again, last year a dozen bills were introduced to provide that the Interstate Commerce Commission shall establish uniform rail rate scales for application throughout the country based on distance. Some of these bills would have required the establishment of a uniform classification and class rates only: others related to all freight rates. Proposed permitted exceptions to uniform ratings and rates were somewhat at variance, but were limited to a narrow range of circumstances and the intended application thereof to actual situations was extremely indefinite. No provisions were made as to how import and export rates were to be dealt with, and in the absence thereof they, too, would have to be established on a uniform basis according to the length of the rail haul.

Since very few transcontinental rates have been established on a distance basis, a revolutionary change in rate making, such as the strict adherence to "uniformity in relation to distance," would undoubtedly be prejudicial to the Pacific Coast. There being no means for determining in advance the probable level of the contemplated distance scale or the progression upon which rates for the longer distances would be constructed, it is impossible to say just what would happen to our import and export rates in the event of rail rate uniformity. Judged by past experience in the rigid application of the distance theory, however, such rates undoubtedly would be so high in and of themselves or as related to those which may be established to and from the Atlantic and Gulf ports, as to prevent the movement of competitive traffic thereunder.

While it is gratifying that, perhaps because of the strong opposition of many shippers, chambers of commerce, state public service commissions and others, the 78th Congress did not dispose of these bills before it adjourned, the subject con-

(Continued on page 104)

4. See report of Interstate Commerce Commission in *Louisiana Sugar Planters Assn.* vs *I.C.R.R. Co.*, 31 I.C.C. 311.
5. See report of Interstate Commerce Commission in *Glidden Company* vs *Chesapeake and O. Ry.*, 229 I.C.C. 599.
6. *Export and Import Rates*, 169 I.C.C. 13.
7. *Mississippi Cotton Seed Crushers Association* vs *A. B. & C. R. Co.*, 238 I.C.C. 87, 251 I.C.C. 643.

Pacific WORLD TRADE

A Steamship Company Viewpoint on Global Aviation

By Arthur B. Poole
Vice President
American President Lines

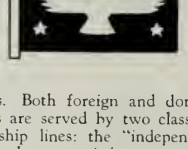
In spite of all that has been said about the program of the steamship companies for operation of air services, there seems to be some muddled thinking even in the shipping industry. This program should not be regarded as a mere selfish desire on the part of a limited number of companies. The entire industry is affected in one way or another.

Passenger traffic is an important, if not a vital, part of the operations of many companies. In the following article the applicants for air certificates are listed. Does anyone think that the entire shipping industry would not suffer if the passenger business of these companies were to be seriously impaired? Many of our most important passenger services are included.

With the idea of keeping the issue clarified, and in the forefront of the industry's thinking, we submit a summary of remarks made before the aviation section of San Francisco's Commonwealth club. Mr. Poole is vice president and treasurer of the American President Lines and a consulting professor of Stanford's Graduate School of Business. He is past president of the Foreign Trade Association of San Francisco and of the Propeller Club, Port of San Francisco.



ARTHUR B. POOLE



The Functional Divisions of the Steamship Industry

Most steamship lines are essentially either in foreign trade routes or in domestic trade routes, although the foreign trade routes often include a little incidental trade between domestic ports. Domestic trade routes include inland waterway, coastwise, intercoastal, and offshore territorial routes. Both foreign and domestic trades are served by two classes of steamship lines: the "independent" lines, who are strictly common carriers, and the "captive" lines, whose primary reason for existence is the carriage of the goods sold by parent or affiliated companies.

Only steamship lines of the "independent" class operating on offshore territorial and foreign trade routes have applied for air transport certificates. On the Pacific Coast there are two such applicants, Matson, seeking certificates to Hawaii, Australia, and New Zealand, and American President Lines, seeking a certificate to the Far East. Elsewhere in the country a total of seven other lines are current applicants for certificates. Each of these applicants is well known and long established on its respective routes.

Since the date of Mr. Poole's remarks, American President Lines withdrew its application pending determination of the national policy toward steamship lines in air transportation. A table of all steamship lines known to be interested in air transport appears on this page.

The Aim of Surface Lines

Offshore water lines are in the transportation business, rather than in the "steamship" business. They want to make use of planes because their customers will want plane service. They have shifted from sail to steam, from wood to steel, and from paddle wheel to propeller, to serve their customers in the past, and see no reason why a further change should be denied them. Almost without exception, steamship lines are applicants for plane routes such

Line	Foreign	Domestic
Agwi	Caribbean	Porto Rico
American Export‡	(1) Central Europe-Mediterranean-Bombay	
	(2) N.E. So. America-So. & N.W. Africa-Rome	Porto Rico Virgin Islands
American President*..	Transpacific	
American So. African.	South Africa	
Grace‡	No. Coast So. America	Panama
Matson	Australia-N. Z.	Hawaii
Moore-McCormack	(1) North Europe	
	(2) E. Coast So. America	
Seas Shipping	South Africa	
United Fruit*	Central America	Panama, Porto Rico
United States†	Central Europe	
Waterman		Porto Rico

* Applications withdrawn for the present.
† Formal application not made; letter of intent filed
‡ Grace is already a 50 per cent partner with Pan American in plane service from Panama down the west coast of South America. American Export already has temporary certificates to Foynes, Ireland, and Lisbon, Portugal.

antially the same as those now erved by ships.

The Civil Aeronautics Act

Section 401 directs (not merely uthorizes) the CAB to issue a certificate to any applicant who is fit, illing and able to supply service hich is required by the public conenience and necessity, and will onform to the CAB's regulations. n the case of service to a foreign ountry, however, the President may lter or reject the CAB's decision.

he Proposals of Other Applicants

(1) Pan American first asserted hat because of its pioneering expeience, and success in overseas aviaon, and because a single American ag air operator could best compete vith foreign flag air lines, it alone hould be allowed to conduct transceanic aviation.

(2) More recently Pan American as proposed a similar monopolistic merican flag air line to be conrolled and dominated by Pan Ameri-n but to have participation in oth ownership and operation by ther American air lines. The other r lines, with the exception of nited, have not found this proposal ceptable.

(3) Other applicant air lines propse that overseas certificates be mited to those already engaged in ir transportation, on the ground hat they have the experience in air peration and have a moral right to because they had the courage and nterprise to start early.

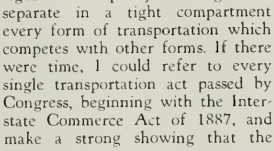
(4) Comparatively few applicaons for overseas air certificates have een made by others than Pan merican, domestic air lines, and eamship lines.

he American Export Airlines Case

American Export Lines formed an r subsidiary. American Export ien secured from the CAB a translantic air certificate, and a decision hat the use of a subsidiary did not onstitute a "consolidation, merger, - acquisition of control" involving pplication of Section 408 of the .A. Act. The tests applied to a onsolidation, merger, or acquisition e more extensive and restrictive ian those applied to an applicant nder Section 401. Pan American ppealed this decision to the United tates Circuit Court of Appeals, here it was held that supplying a ubsidiary corporation organized for r purposes was an "acquisition of ontrol." On subsequent proceedings the CAB found that American Export could not meet the restrictive tests of Section 408 and ordered Export to divest itself of the air subsidiary.

By a process of reasoning which many people are unable to understand or follow, the CAB has decided, without the aid of the court, that the operation of airplanes by a surface carrier is a species of "consolidation, merger, or acquisition of control," and that therefore surface carriers can only be allowed to use planes incidentally to, but not in competition with, their surface vehicles.

In taking its position the CAB justifies itself by reference to an alleged historic policy of Congress to separate in a tight compartment every form of transportation which competes with other forms. If there were time, I could refer to every single transportation act passed by Congress, beginning with the Interstate Commerce Act of 1887, and make a strong showing that the



Congress in fact asks for the "developing, coordinating, and preserving"* of a national transportation system, rather than its break-up into uncoordinated and unrelated units.

The Principal Elements of the Case Of the Merchant Marine for Air Certificates

The steamship companies have built up over generations, integrated staffs, knowledge of local laws and customs, customer acceptance, established locations, and relations with local governments, which are of great value to airlines to be set up, and which will take unnecessary years of time and millions of dollars to duplicate.

Competition with foreign flag lines will be by route and against foreign **integrated surface-air carriers.** Thus integrated American flag surface-air carriers can best meet foreign flag competition.

Coordinated surface-air service will best meet the requirements of the many travelers who indicate a desire to travel partly by sea and by water, and travelers who for any reason may want while en route to shift from one to the other.

Steamship companies should be given every encouragement in the use of the newest and best equipment which inventors may devise for the convenience of the traveling public.

The allegation that steamship companies will use air certificates only to hamper air development to save their investment in ships, falls to pieces immediately when one sees the relative investments which these companies have in steamships and propose to make in air transport.

The Merchant Marine Act, 1936, specifically directs the Maritime Commission to study the use of transoceanic planes in lieu of superliners.

It is far easier, cheaper, and quicker for steamship companies to buy adequate planes and to hire competent technical flying personnel, than for domestic air lines to create the foreign offices, contacts, knowledge, understanding, and good will now had by steamship companies.

Coordinated service will more surely lead to the choice by the traveling public of the service it prefers, at its true economic cost, and thus strike that balance between surface and air transportation facilities which is in the public interest.

Suggestion to Section

The present attitude of the Civil Aeronautics Board seems to be antagonistic to applications of steamship companies for air certificates. The steamship companies ask only for the opportunity to take their places among all other applicants, and to be awarded certificates when they can prove that they are the ones who will best serve the public convenience and necessity. To deny steamship companies that opportunity is like calling three strikes against one of the strongest batters on our transportation team before he stands up at the plate.

* The quotation is from the Transportation Act of 1940.

"U. S. Shipping"

(Continued from page 96)

unpublished statistical information, M. J. Buckley, vice president, American President Lines, calls the book "a pioneering and lasting contribution to the cause of international economy and social relationships."

Pacific World Trade

Tariffs

(Continued from page 89)

Most manufacturing industries depend on imports of one kind or another. We may hear much about displacement of American production by imports, about the proportion of imports that are free of duty, and perhaps even about infant industries. However, it should be borne in mind that it may be the very tariffs themselves that are complained of that are keeping the costs up and infant industries down. It is so with many.

Imports are a very necessary part of our economy, and for a senator or anyone else to say that "vast exports and equally vast imports cannot increase the well-being of our citizens," his knowledge must be very limited, because trade statistics clearly prove that periods of highest imports, as well as exports, invariably coincide with the highest periods of our national prosperity.

On the export side, 35 per cent of all cotton is directly exported. So is 53 per cent of all tobacco and an average of 26 per cent of all farm produce. Would the senator claim that 35 out of every 100 people growing cotton were not benefited by exporting? Or 53 out of every 100 people growing tobacco? The senator comes from a farm state and should know that its citizens are benefited in proportion to the volume of exports.

On the import side, one hundred million coffee drinkers would not agree that imports benefit no one, nor would the automobile driver, farm or city, who would lack rubber, or the doctor's patients who would lack quinine, and so on through a thousand items that make our lives serene.

Perhaps the senator "doesn't know there is a war on," and that the merchant marine, which stood the test at Dunkirk, at Malta, at North Africa, at Normandy, at Anzio and Sicily and a hundred spots in the South Pacific, was made possible and necessary by the exports of cotton and the imports of coffee as well as countless other world trade commodities, a trade which he decried.

Since many of the very members of the American Tariff League to whom the senator was speaking are exporters it would appear that they want some source other than imports to supply the equivalent of the dollars in the foreign market by which their own industries live.

Australia to Step Up Its Shipbuilding Program

Indications that Australia plans to develop and expand its shipbuilding industry after the war were given recently when a revised shipbuilding program was announced and the second largest graving dock in Australia was opened. Giving details of the building program, Navy Minister Norman Makin said there would be a fivefold increase in the construction of 2500-ton freighters, and approval had been given to the immediate construction of a number of 550-ton freighters for the Australian coastal trade. Work is to continue on the building of two other types of freighters of 9000 and 4000 tons.

Australia, said the Minister, was passing through a phase where a demand for small handy vessels for the coastal trade had been superimposed on the demands for larger oversea ships. Limiting factor of current shipbuilding progress was the demand for docking and repairs and the heavy maintenance of naval and merchant vessels on war service. The volume of merchant-shipping repairs still kept up a steady monthly average of about 1,250,000 tons.

A $3,250,000 graving dock at Brisbane, Queensland, opened by Australian Army Minister Francis Forde, will provide immediate repair facilities for Allied ships engaged in the Southwest Pacific area but will be an asset for Australia's peacetime shipping. Built during the past two years, the dock is next biggest to the uncompleted Sydney harbor dock and gives Australia its first large-scale ship-repair base north of Sydney. When opening the dock, Mr. Forde said that the Australian shipbuilding industry now employed 22,000 workers and the Government did not intend to allow it to lapse after this war as it had after the last.

Rail Freight Rates

(Continued from page 101)

tinues to be an exceedingly live and controversial one. The reintroduction of these measures in the next Congress appears to be a certainty. When a bill providing for the elimination of the requirement that certain Government traffic be accorded so-called "land-grant" rail rates was reported out of committee a few days before adjournment, one of the senators proposed an amendment to the effect that the bill, if passed, would not become effective until the rail rates of the South were reduced to the level prevailing in the North—the identical subject from which the agitation for rail rate uniformity arose. If future foreign trade through the Pacific Coast is to be fostered and fully developed, careful consideration to legislative proposals of this nature by those connected with our port and maritime interests is absolutely essential.

If the Pacific Coast is to occupy that dominant position to which its geography, its transportation facilities, its natural resources and the character of its people entitle it, two things are indispensible — alertness and cooperation. If we are alert to impending dangers and cooperate in combating them our future is assured. While there is danger in being over optimistic, a great future in world trade unquestionably lies before our Pacific ports.

Certain combat ships of the U. S. Navy carry six miles of steel cable almost an inch in diameter, and capable of lifting 30 tons, says "Ships" magazine.

In Argentina the family with the greatest prestige, social and financial, bears the fine old Spanish (sic) name of Dugan. The hero of Chile was none other than O'Higgins — Latin indeed!

Navy Refrigerated YP Tuna Clippers

HARBOR BOAT BUILDING COMPANY DESIGN AGENT FOR TYPE

Another interesting launching occurred recently when the Harbor Boat Building Company launched a new-type Navy refrigerated tuna clipper at its Terminal Island yards in Los Angeles Harbor for use in transporting perishable goods in the South Pacific war theater. The 128-foot vessel with 29-foot beam, driven by a direct reversing Union diesel of 560 hp turning a 6″ propeller shaft and a 77″ wheel, was christened by Mrs. John Rados, wife of the company's president. Mrs. John Martin, wife of the plant engineer, was matron of honor.

Two auxiliary Union diesels will drive 120 kilowatt generators. Refrigeration equipment consists of two $6\frac{1}{2}$x$6\frac{1}{2}$″ compressors, driven by 30-hp Fairbanks Morse motors. Below decks are 4 steel and 6 wood wells with 3 wood tanks on the main deck aft, all encircled with ammonia coils, which give the ship a refrigerated cargo capacity of more than 250 tons. Accommodations include staterooms on the secondary deck for three officers and 20 men.

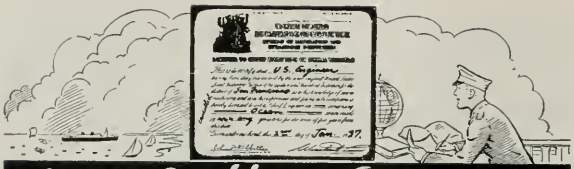
The company is design agent for fleets building in 15 different shipyards on the Pacific Coast. This new YP design is based on its 24 years' experience as builders of tuna clippers and fishing boats, augmented by new procedures and materials developed by it while building more than one hundred ships of various types for Navy war use. Myles Rados is the naval architect.

Right: Harbor Boat Building Company launches another refrigerated tuna clipper. This new-type design is now being built by 15 different West Coast yards.

Below: John Rados, president of the company, helps his wife christen YP-618. Matron of honor was Mrs. John Martin, wife of the plant engineer.







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Fluids In Motion

Bernoulli's Principle and the Marine Engineer

Based on many experiments, Bernoulli, an early Italian scientist, formulated the theorem that: where the velocity of a fluid is high the pressure is low and where the velocity is low the pressure is high. He found this to apply in closed channels, or in the open, such as the air or bodies of water.

This principle affects the marine engineer through many devices he uses to measure rate of flow, velocity, and sometimes pressure. It affects the ship's officers in moving the ship in narrow waters or closely passing other ships. It affects the weather and explains many of the observed results of wind and water in motion. It contributes to aerodynamics and the airplane both as to lift and control.

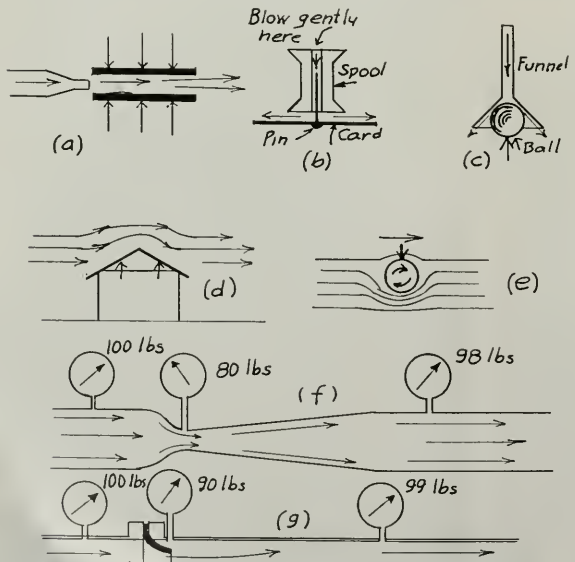


Figure (a) shows a jet of air being discharged between two plates suspended and free to move. A strong force is set up moving the two plates together, in spite of the almost obvious conclusion that they would be blown apart. The velocity between them being higher, the pressure is lower than that in the air outside.

In Fig. (b) air is blown into a spool. A card with a centering pin is suspended beneath the spool by the low velocity higher pressure air below. The high velocity low pressure air in the space between the spool and card represents a low pressure area. The card is suspended against not only gravity but the jet force of the issuing air.

Or as illustrated in Fig. (c), a ball is sucked up into a funnel in spite of the fact that air is being forced out of it against the ball. It is interesting to note that if a tube were used for the experiment in Figs. (b) and (c) without the flange at the opening of the tube, the card and ball would fall or be blown away. Or, as is obvious, the low pressure area must be outlined or walled-in sufficiently to prevent other air from rushing in to equalize the pressure difference. When not so walled-in the marginal turbulence characteristic of all jets is evident.

Figure (d) explains the frequent damage to houses from high velocity winds. The roof is lifted off because of the high velocity low pressure area above it caused by the house as an obstruction in the path of the wind. Windows may be blown out rather than in. This principle becomes part of the explanation of the whirlwind, whirlpool, smoke ring and other interesting phenomena.

Also Bernoulli's theorem is used by the golfer and baseball pitcher, and affects the path of flight of balls, bullets, projectiles and moving objects which are at the same time spinning. Figure (e) illustrates a ball in flight which is also spinning in a clockwise direction. The ball moving toward the right may be considered as stationary with the surrounding air velocity toward the left. The action of the surface of the ball is to carry the air with it, slightly crowding

mre air below it and less above. Tis in effect increases the velocity ofhe air below it, decreases the air vocity above, and thus gives a hih pressure area above and low pissure area below. This pulls the bi down, and is the trick the skilled pther uses to cause the ball to drop sudenly in its curve toward the bter.

A study of Figure (e) would ornarily lead one to conclude that th ball would rise rather than drop, wh the rotations clockwise and th velocity toward the right. The pposite, however, is the case. This sa.e principle is used in the Flettner ror for ship propulsion, which asted the propeller by using wind pcer through Bernoulli's principle.

n the demonstration of this device w cylinders, approximately six feet n liameter and 40 feet long, were mnted on the deck of an auxiliary sing vessel. This ship had a proer shaft hp of about 1400, giving hea speed, without sail, of around 10knots. With the most favorable wid direction and the rotor cylinders ured by electric motors using 75 hp, he made as high as 10½ knots wiout using her main engines. Wh engines and rotors both workngshe made as high as 14½ knots Th experimental ship, with a full aro, crossed the Atlantic several in's. The large rotors used in this ysm and their height above the ed makes necessary very lightweht construction. The resultant oer effect is dependent on nercy smooth surfaces rotating with eect truth. It is very difficult to ntain such conditions aboard ship. h Flettner rotor is used now largeg canal boats and in making windil of much greater efficiency than ordinary vane type.

Iobably more familiar to the ane engineer is the venturi tube. i izes smaller than a lead pencil rasures air speed of the airplane. zes large enough to drive a truck rgh it measures the rate of flow ater to a city. Figure (f) illusas the venturi throat schematil The surprising thing about this ve is that while there is a large eure drop at the restricted throat, night be expected, the overali eure drop is very small, as indi- by the gages in the figure.

Fr measuring the flow, the differc between the pressures just fe the throat and just at it is a ile indication. This pressure difference can be indicated on a U-tube, or manometer, or differential gage. Then, in order to recover as much as possible of the pressure lost at the orifice, the area is slowly increased to the original value. By properly shaping the tube the final pressure is closely approached. Streamlining is important to reduce overall pressure loss. Eddies and side wall friction in the stream flow result in pressure loss.

Much the same condition exists in the steam flow devices used aboard ship. A short throat is installed at a flanged joint, Fig. (g). When only a slight drop is needed for the indicators the overall pressure loss is hardly noticeable. Frequently only a plate with an orifice or hole in it is used instead of as shown at Fig. (g).

Our next article will discuss these same principles as applied to the movement of ships through the water.

New Type "Viking" Ladder

A new "Viking" type pilot ladder, designed by Capt. Harald Fritzner and manufactured by his company, the Viking Marine Co., in cooperation with his other concern, the Ballard Rigging and Sail Loft Company of Seattle, is now on the market.

This ladder incorporates many safety features in its construction, is of the non-tilting and non-twisting type, and makes the operation of boarding or leaving a ship a comparatively safe one, even in the most rugged weather.

The ladders are produced in two types, one with chain for the suspension member, and the other with wire rope. As shown in illustration at E, a mortise and tenon join is used in fastening the step treads to the ears, thereby forming a means of preventing ears being broken off by twisting strains, side blows and rough treatment when the ladder is in use or in stowage. The non-tilting feature is attained by the design of a flat-sided ear, as shown at B, which is of such practical proportions that it rests solidly against the ship's side, without increasing the bulkiness when stowed. Non-skid treads as shown at C, canvas covering of suspension members for the full length of the ladder, spacing of treads to provide ample hand grip space on the outboard rung (an advantage for men wearing gloves of the northern winter weather type), comprise several of the better features.

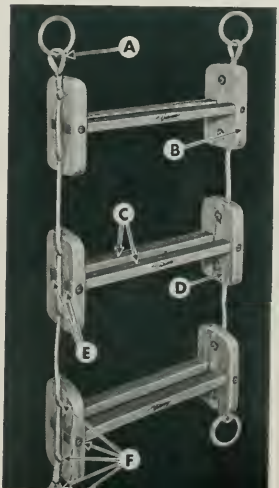


The fastenings of suspension members to the ears, as denoted by F, will withstand a load of 4,000 pounds on the assembly, yet will permit the easy replacement of a damaged step without the removal of any other step. These ladders are adapted for service side by side or are reversible top to bottom, as denoted at A and F.

They have been thoroughly recommended by members of the Columbia River Pilots, Puget Sound Pilots, and American Pilots Association.

C. J. Hendry and Company are the distributors in California, while the McCune Merrifield Company are the territorial sales agents on the Pacific Coast.

The Viking Marine Company, which has it head office in the Colman Building, Seattle, manufacture, in addition to ladders, a line of marine specialties and rigging.





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The Gyro-Compass

PART III. A True, North-Seeking Gyro-Compass

(Illustrations courtesy Sperry Gyroscope Co., Brooklyn, N. Y.)

The oscillation of the gyro about the meridian, discussed in my last article on the gyro-compass, may be clearly understood by reference to Fig. 16, which shows the movements of the gyro axle projected onto a vertical plane. The ellipse in this figure is the result of a displacement of the gyro axle only a few degrees either east or west of the meridian. If the gyro axle were pointed east and west at the beginning of the cycle, as shown in A, Fig. 15, previous article, precession would take place through 180 degrees in each direction, and at one extreme the north end of the gyro axle would point east (as it did in A and B, Fig. 15); at the other extreme the north end of the gyro axle would point west. The ratio of the gyro's movement about its horizontal axis, caused by "apparent rotation," to its movement about its vertical axis (caused by the flow of mercury in the mercury ballistic from one set of reservoirs to the other), determines the shape of this ellipse. If the free surface of the mercury in these reservoirs is increased so that more mercury can be transferred from one side to the other, the rate of precession about its vertical axis will increase, and as a consequence the ellipse will be flatter. If the transfer of mercury between reservoirs is decreased, the rate of precession about its vertical axis will be decreased, or reduced, to a point where the ellipse will, at least theoretically, be circular.

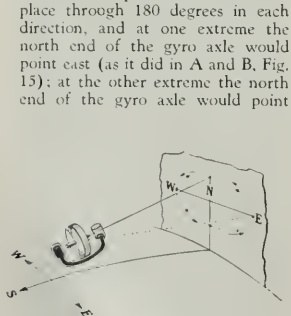


Fig. 16. Diagram showing the movement of a mercury-controlled gyro wheel when set with its axle pointing east of north.

In my previous articles I have explained how the gyro is converted into a mechanically operated north-seeking device, in the simplest manner possible. I have shown that by taking advantage of the rotation of the earth, and by use of the mercury ballistic element to enable us to take advantage of, and make use of the earth's gravity, we can cause the gyro's axle nearly to align itself with the meridian. But, as I have previously stated, the gyro axle never comes to rest where it will become

a true north-seeking device by u of the mercury ballistic alone. The fore we have to use some oth means to accomplish this, and to so we must apply force at some oth point.

In my last article I have explain the behavior of the gyro under t simplest form of mercury contr the mercury ballistic being attach directly to the ring or frame whi supports the gyro. However, w such an arrangement the mercu ballistic can only act about the ho zontal axis of the gyro. This be the case, the gyro will precess o about its vertical axis. Therefore is necessary to devise some means create additional pressure (to ap force) about its vertical axis where it can be made to precess about horizontal axis in order to offset t natoral tendency of the gyro to t Several such means have been vised and adopted, but the one wh I describe herein is the one used the Sperry Gyroscope Company the Mark XIV Gyro-Compass.

Let us go back for a moment the make-up of the gyro-comp and consider Fig. 11 (Part II) ag which shows the elements of gyro-compass. In this figure showed the addition of the ou frame (4), called the phantom ment, which, you will recall, is driv by an electrical follow-up system that it follows every movement the gyro about its vertical axis. supporting the mercury ballistic in bearings in the phantom ring can control the gyro about its v tical axis, and "dampen" its osc tions, thereby causing the axis of gyro to align itself with the meridi that is, cause it to settle down point true north.

We accomplish this by connect the mercury ballistic to the gyro (rotor case) by a link arm, the arm being secured to an eccen stod on the bottom of the rotor at a point 11/64 of an inch to east of the vertical center line the rotor case. (See Fig. 11 [By doing this the greater effect the mercury ballistic still contin to bear down on the horizontal and cause the gyro to precess ab its vertical axis toward the meri

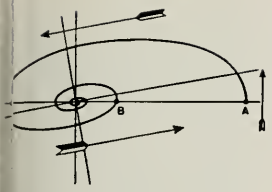


Fig. 17. Action of the gyro axis when the mercury ballistic is connected to its casing through an eccentric pivot.

a formerly, but we now have some pressure on the gyro's vertical axis which will cause it to precess about its horizontal axis, thereby causing the gyro to tilt in a direction opposite to its natural tendency to tilt, resulting from "apparent rotation." Hence the end of the axle will follow a path shown in Fig. 17. By such means the oscillation of the gyro is "damped." A little study of the action of the mercury ballistic will make it clear that the only position of rest which the gyro can find at the equator will be with its axle horizontal, and in the meridian. In other words, we have at last obtained a true, meridian-seeking Gyro-Compass.

The extent of the "damping" action is governed by the offset of the eccentric stud from the center line of the rotor case, as I have shown before. Commercial compasses are given a "damping factor" of 66 per cent. That is, the eccentric stud is offset so that each swing of the gyro axle from the meridian is one-third of the preceding swing, the amount of swing being reduced by 66 per cent for each half oscillation. If, for example, a compass is started 30 degrees east of the meridian, the first swing will carry the compass to 10 degrees west of the meridian; the return swing to 3-1/3 degrees east, then 1 1/9 degrees west, and so on until the gyro finally comes to rest.

The natural period it takes for a compass to perform one complete oscillation (from A to B as shown in Fig. 17) is 85 minutes, and this period of oscillation is governed by two factors:

1) The angular momentum of the gyro (weight and speed of gyro).

2) The torque about its horizontal axis which is supplied by the action of the mercury ballistic (governed by the free surface of the mercury in the reservoirs and the distance of the reservoirs from the horizontal axis of the gyro).

We must, however consider some other factors before we have a gyro-compass which will function accurately and reliably, at various latitudes other than the equator, and on a ship which, for the most part, rolls and pitches as she travels over the earth's surface at various speeds.

You will recall that the action of the mercury ballistic about both the vertical and horizontal axes of the gyro is made possible by use of the phantom element, and that this element serves another important purpose in that it provides a means of suspending the gyro so that it is practically free from friction about its vertical axis. Also that the gyro is supported from the top of the phantom by the suspension, and that the phantom is kept in exact alignment with the gyro by means of an electrical follow-up system. Therefore, with the exception of the connection between the mercury ballistic and the gyro case by the link arm, and the upper and lower guide bearings, there is no physical contact between the phantom element and the sensitive element. If the compass were to be used on shore, the most logical way to control the gyro would be by suspending a weight from the phantom, similar to a pendulum, and by connecting this weight to the eccentric stud on the bottom of the rotor case. Such a method, however, would be impractical on board ship, where the compass would be subjected to the roll of the ship. Another method would be to stabilize the compass gyroscopically and prevent it from swinging. However, in the compass under discussion, the complication of stabilizing the gyro is avoided by use of the mercury ballistic which, as I have already explained, controls the gyro. The mercury ballistic is non-pendulous; its weight is distributed equally above and below the gyro axle so that it is neither top-heavy nor bottom-heavy, and no acceleration forces, caused by the rolling of the ship, are generated; hence there is no torque about the vertical axis of the compass. Under a slow rate of inclination, such as that caused by the rotation of the earth, the action of the mercury ballistic is equivalent to that of an ordinary pendulum, but in an opposite direction. Under a rapid rate of movement, however, the small bore of the mercury tubes prevents the mercury from surging back and forth and introducing errors in the compass.

Unsymmetrical distribution of weight is another potential source of disturbance when the compass is swinging, and must be neutralized. When an unsymmetrical weight, such as shown in Fig. 18, is swung in the plane A-B, centrifugal stresses act upon it in such a way as to cause all of its particles to place themselves as far as possible from the axis of the swing. This causes a tendency to turn, as shown by the arrows. The same effect may be observed when a watch is swung back and forth on its chain through a small arc. In the gyro-compass this effect is avoided by the use of compensating weights which make for a symmetrical distribution of weight about the gyro's vertical axis.

The foregoing explanation applies particularly to a compass at the equator and on a ship not under way. At points other than at the equator, and aboard ships which are moving over the surface of the earth, certain factors are introduced which will result in errors if they are not compensated or corrected in the design of the compass. We will discuss these in our next article.

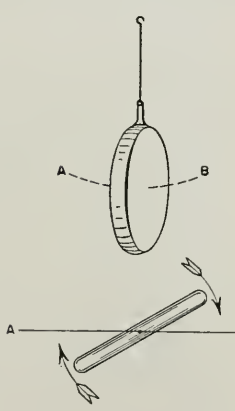
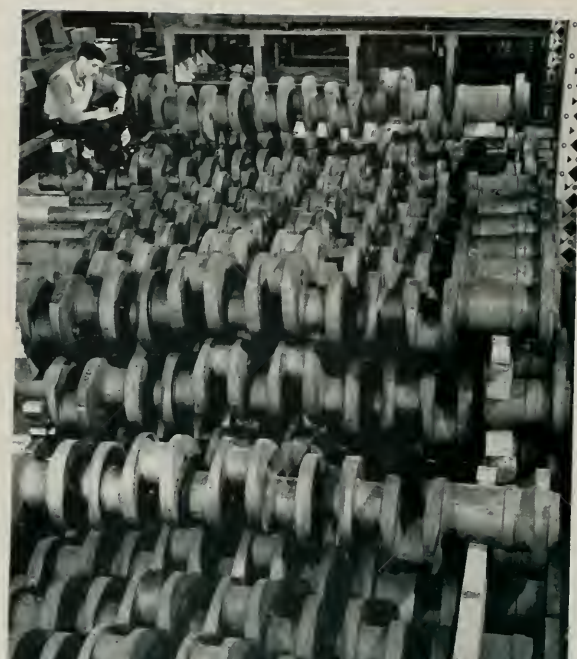


Fig. 18. Effect of unsymmetricol distribution or weight.



Cast crankshafts as they come from the foundry.

Cast Crankshafts for Large Marine Diesels

The experience of the U. S. Army in successfully using Proferall cast crankshafts in large Enterprise diesels of the direct-reversible marine type may result in materially lowered costs of engine production in the post-war era.

When the war emergency started in this country, the Government called upon diesel manufacturers to increase engine production to a level exceeding by several times previous records. However, in meeting the goal set by the Government, diesel manufacturers faced an acute shortage of forged steel crankshafts. With the war demands for all types of equipment severely taxing the heavy forging facilities of the nation, it was apparent that delivery of engines needed for all types of vessels under construction in all the shipyards would be reduced to a mere trick

The gravity of the situation m be best judged by the fact that the U. S. Navy today, horsepow developed by diesels far exceeds t combined power outputs of all stea equipment. Besides supplying the d mands of the Navy, diesel manufa turers were also expected to meet t requirements of the U. S. Army a Maritime Commission. The lack forged crankshafts, however, creat a bottleneck that could not be elim inated until some substitute w found.

Colonel W. W. Moore, USA, f many years in charge of the desig ing and building of various types vessels for the Quartermaster Ge eral and later for the Office of th Chief of Transportation, U. S. Army made a personal investigation an study of the matter. His findings le to the conclusion that cast crank shafts would perform successfully i large, direct-reversing marine diesel Completely satisfied with his finding Colonel Moore decided on the adop tion of 11-inch cast crankshafts fo this type of engine, despite skepti ism from his staff and many othe diesel experts.

Acting on this belief, and in view of the time element involved, Colone Moore decided against the usua policy of ordering a single experi mental engine and placed orders fo a large number of eight-cylinde diesel engines with cast crankshafts These engines were all Enterpris direct-reversible marine diesels wit 16″ bore and 20″ stroke. Equippe with Buchi-type turbochargers, the were designed to develop 1200 t 1400 bhp at 275 rpm for installatio in large Army tugs. This decisio eliminated the production bottleneck with the result that the Enterpris Engine & Foundry Company wa able to deliver the required engine to shipyards in ample time to mee production schedules.

The cast crankshafts carefull analyzed in regard to torsional vibra tions, were produced by Campbel Wyant & Cannon, one of the firm that has had extensive experience i the manufacture of medium cas shafts for stationary engines.

Subsequent performance of thes vessels has amply substantiated th soundness of Colonel Moore's view in pioneering the use of cast crank shafts for larger marine engines. I the past year the vessels have give excellent service during thousands o

ours of operation in the various ar theaters.

The cast shafts have certain specific dvantages over the conventional orged crankshaft, as follows:

1) Less time is required for production.
2) Less waste of material (see illustration).
3) Less time required for machining as compared with forged shafts.

Cast crankshafts operate exceponally efficiently where the original ngine design provides for liberal haft dimensions above normal reuirements to care for torsional ibrations.

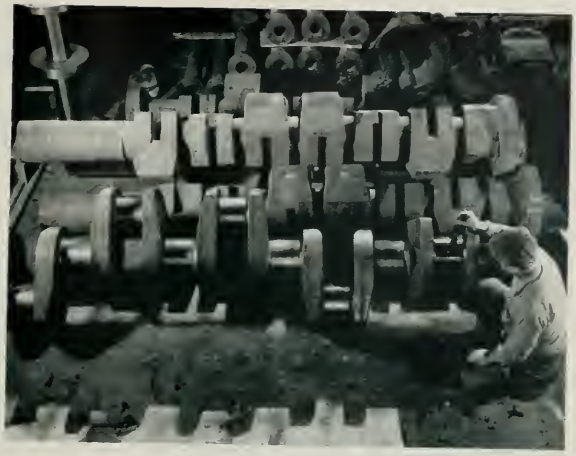
Material hardness is from 250-320 rinell. Material responds excellently polishing, thereby providing exptionally good bearing surfaces. he physical properties of cast roferall material in these large ankshafts have been determined be as follows:

Tensile strength: 52,000 psi for andard material and 56,000 to ,000 psi for special alloys.

Torsional modulus: based on the oportion of stress-strain used in tual practice, i.e., 4,000 to 8,000 i, the resulting slope of line gives torsion modulus of 8,000,000, as mpared to 11,800,000 for steel. orsional calculations based on this latter value yield results which agree with actual results.

The American Bureau of Shipping, in computing cast shafts, uses the same formula as for steel. However, it uses value of f = 4300 for standard Proferall material and f = 4600 for the 56,000 psi material. This results in a 7 per cent increase in shaft diameter over that required for forgings.

While at the present time it is difficult to predict the influence that Colonel Moore's pioneering will have on the future of the diesel industry, it is a certainty that the industry will continue research on the matter of cast crankshafts, which may result in reduced production costs of diesel engines in the past-war period.

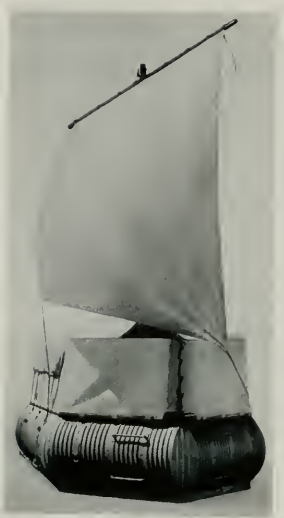


Cast crankshaft in foreground; two forged crankshafts at rear. Note difference in material to be removed by machining.



Finish machined cast crankshaft.

From Wire Springs To Life Rafts



"Before Pearl Harbor" L. A. Young Spring and Wire Corporation's branch factory at Oakland, California, was well known as a place where automobile cushion springs and diversified wire products were manufactured.

Immediately after the Pearl Harbor affair the first order received was for 15,000 crew berths for Australia-bound troopships, to be delivered complete in 17 days. This job, which included the fabricating and welding of special pipe frames; the making of canvas bottoms, requiring 60,000 splices and 140 miles of rope lashings, was delivered on time.

Soon the company was manufacturing all kinds of marine equipment for the Army Transport, Army Engineers, Chemical Warfare, Maritime Commission and various branches of the U. S. Navy, which required the use of wood, sheet metal, canvas, rope and light structural steel.

However, its greatest achievement in this war program is the design, construction and output of the "Super-Young Steel Truss Luxury Life Raft." The engineering and design staffs worked with the various maritime agencies in this country and Britain in developing this remarkable piece of life-saving equipment, and new improvements, requested by these agencies, have been incorporated from time to time.

The body of this raft, designed to a minimum size, with a maximum buoyancy and stability, to carry 24 men, consists of 28 all arc-welded steel subdivisions forming one unit when complete. Several of these watertight subdivisions together carry a total of 1000 pounds of easily accessible food, water and miscellaneous equipment, which includes blankets, compass, life preserver, first-aid kit; canvas berth bottoms for sick or injured, fishing equipment and other items necessary to sustain life and morale for many days for the boys who may ride the raft.

The raft was designed to take a drop of 45 feet on its side, nose or flat, topside or bottom side up, and has been approved, and is inspected by, the U. S. Coast Guard.

The company has also designed and is manufacturing doughnut type steel life floats with a capacity for 55, 40, 25 and 15 men, and for a long time has been turning out as many as 20 a day. It has built up an enviable record in the manufacturing of efficient marine life-saving equipment.

Left: The Super-Young steel truss luxury life raft with all canvas spread.

●

Below, top: The life raft hitting water in test drop of 45 feet.

●

Below, bottom: A 55-person float with its 220 lbs. of provisions and water.



International Paint Co. Plant Expansion



J. F. Shingle, vice president.

The International Paint Company of California, Pacific Coast subsidiary of the International Paint Company, oldest and largest marine paint manufacturers in the world, has recently expanded warehouse and manufacturing facilities, located at 970 Tennessee Street, San Francisco.

These facilities are now housed in a modern building, covering an area of 15,000 square feet and extending from Tennessee to Minnesota Streets. Considerable manufacturing equipment has already been installed and space has been provided for additional manufacturing equipment as soon as it is available. The enlarged warehouse space will enable the company to carry a wide assortment and larger stock, thereby offering a better immediate service to their customers on the Coast.

Earl Spotswood, plant manager.



All this expansion program was undertaken in order to take care of the tremendous increase in the business here, and is significant of the company's faith in the future of the Pacific Coast.

The company has been in operation in San Francisco for over 40 years. J. F. Shingle is vice president in charge of operations of the International Paint Co. of California, H. S. Luken is secretary-treasurer, and Earl Spotswood is plant manager.



A corner of the chemical laboratory.



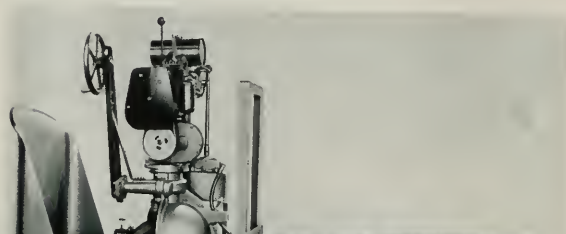
A corner of the plant, showing some of the paint - mixing equipment.



A portion of the stock carried.

Keep Posted!

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK



Model D Truck-Man.

New Truck-Man Announced

A new Truck-Man, designed for moving skidded loads of one ton or under, has been announced. It introduces new features designed to provide safe, efficient moving of today's war materials and the materials of post-war tomorrow.

Easier, safer operation and greater flexibility have been built into the new, improved one-ton capaci Truck-Man, which is manufacture by Yard-Man, Inc., Jackson 5 Michigan.

One of the important improv ments is a patented two-speed driv which makes both a low and a hig speed instantly available. The lo speed is adapted for starting, climb ing ramps, going in and out c freight cars or other tight places, an for moving material over rough floor For light loads and movement with out loads, the high speed is instantl available. The Truck-Man turns i its own length.

Steering has been improved by th use of a large ball thrust bearin which reduces steering effort to bu a fraction of the effort formerly re quired.

More comfort, with accompanyin lessened fatigue, greater safety an increased efficiency for the driver i achieved by a new operator's seat which has been developed in collab oration with the Safety Council o the Ford Motor Company in th Willow Run Bomber plant. In addi tion to providing a seat with a restful form-fitting back, it provides a sup port when the operator is standing and it also serves as a protectiv shield for added safety. The use o this new seat is particularly advan tageous when women operators are employed, according to reports fron users.

The operation of the Truck-Mar has been made still more dependable through the use of a new, more sen sitive fly-ball type governor, which replaces the old pneumatic type. I is enclosed, and is much more sen sitive in action. The entire unit is sealed so the operator cannot disturb it without breaking the seal.

Other improvements include heav ier load wheels with a four-inch tread and a larger gas tank of one gallon capacity which provides suf ficient fuel for eight hours of norma operation. "V" type belt brakes automatically set when the machine is not in action, thus providing an add ed measure of safety.

A Direct-Line Hook

A new direct-line swaged hook is announced by Poulsen & Nardon Inc., Los Angeles manufacturers of stamped parts and fittings. They offer for the first time a hook that can be swaged to the cable. It is claimed that this new method of fastening is

LANDING BARGE IS RETIRED FROM ACTIVE SERVICE

This battle-scarred landing barge is being hauled to Martin Ship Service's yards aboard a heavy-duty Fruehauf carryall trailer, where the landing door will be sealed. From there the barge will be assigned to ship service work.





Direct line hook.

ıster and safer than former methods, ıd eliminates costly splicing and the ıugh, dangerous edges that splicing often leaves.

The new hook has a straight shank ıd is made from alloy steel in a recision stamping operation that re-ins the full strength characteristics the steel. It is so designed that ıe load is on a direct line from the ible. Tests have shown its holding ctor is in excess of the cable rength.

Besides its swaging feature, other lvantages are claimed for this hook, ıch as flattened sides, smooth inside rface, round throat, ample radius, ıd finished point. As illustrated, ıe hook takes ¾" cable. Other sizes re available for 3/16" to 1" cable.

ame Priming and escaling Nozzles

The Victor standard descaling at-chment is easily attachable onto ıy standard welding torch butt. It n also be furnished with torch butt those who are not owners of ıuipment.

This particular flame priming and escaling nozzle has many advan-ges:

(1) It is provided with an unusual-well-designed spiral mixer and gas roportioner to handle with greater ficiency the larger gas volumes re-ıired for these operations.

(2) This mixing device virtually assures freedom from back-fire or flash-back.

(3) In order to keep pre-mixed gases below ignition temperatures, even within the proximity of the ribbon flame and deflected heat, an Airadiator aluminum cooling section is incorporated at the nozzle head.

(4) Replaceable Meehanite skid shoes with properly shaped lugs add substantially to wearing life of the nozzle and allow it to be dragged at any suitable angle over the metal surfaces to be cleaned.

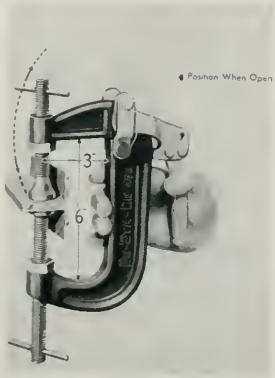
This nozzle is made in 4 inch (Model 361) and 6 inch (Model 362) ribbon flame widths. For inaccessible areas or rivet heads, special Circular Multi-Flame Nozzles are available.

The attachment is manufactured by The Victor Equipment Company, San Francisco.

New "C" Clamp

An improved toggle-action "C" clamp which securely holds a wide range of work has recently been developed by Detroit Stamping Company, 386 Midland Avenue, Detroit 3, Michigan.

Two adjustable clamping spindles grip the work at any selected point, thus permitting clamping over double angles and other irregular shapes. The clamping gap is readily adjustable to any thickness within the clamp range. Each spindle is locked into its place and remains at that exact setting until manually re-adjusted.



"C" clamp.

Quick clamping and release are effected by rapid toggle action. Upon release the entire upper portion of clamp swings clear of the work, as indicated by the accompanying cut.

Other features of this improved clamp are these: Body is a sturdy malleable iron casting. The threaded spindles are copper coated against welding spatter. Links and handle are plated against corrosion.

By changing location of retaining bolts the toggle handle may be adjusted to either straight, out or downward position when clamp is locked.

This newly improved clamp is a 6" size, with extra deep 3" throat and is listed as De-Sta-Co Model No. 480.

KEEP POSTED

The manufacturers of the new equipment announced in this department will be pleased to furnish complete details without obligation on your part. For quick service, please use this coupon.

PACIFIC MARINE REVIEW

500 Sansome Street - - - San Francisco

Send me descriptive data of the following new equipment as reviewed in your .....issue.

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(Identify by name of manufacturer and machine)

NAME.....

BUSINESS .....

ADDRESS .....

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On the Ways—

SHIPS IN THE MAKING



The commissioning of the USS Willard Keith, with Commander Lewis L. Snider accepting command of the ship. Left to right: Commander Lewis L. Snider, USN; Mrs. Willard Keith, Sr. and Willard Keith, Sr., parents of the hero for whom the destroyer is named, and Captain Rivers J. Carstarphen, USN.

War Bond Destroyer Commissioned

First of the destroyers built from funds raised during a recent war bond drive in Los Angeles County, the USS Willard Keith was commissioned at San Pedro on December 27.

So powerful that in the last war she would have been called a light cruiser, the new 2200-ton vessel was commissioned by Capt. Rivers J. Carstarphen, U.S.N., commanding officer of the Naval Receiving Barracks, Terminal Island. Commander Lewis L. Snider, U.S.N., accepted command of the ship.

The ship was named for an outstanding war hero, Captain Willard Keith, Jr., U.S.M.C.R., who was awarded the Navy Cross posthumously for extraordinary heroism leading a platoon against strongly trenched Japanese positions on Guadalcanal in 1942.

His parents were honored guests at the commissioning. Mrs. Keith christened the ship when it was launched on August 29, 1944.

Consolidated Steel's Building Program

A contract to build 15 C-2 cargo and passenger vessels, the largest merchant vessels built in the Los Angeles area, was granted to Consolidated Steel Corporation at Wilmington, California. Work will start immediately and the program will run concurrently with their present schedule on 57 AV-1 coastal cargo vessels and 32 BD-1 Navy transports being built at the corporation's Wilmington and Long Beach shipyards.

The C-2's have an overall length of 460 ft., a beam of 63 ft., and a speed of 15½ knots. The ships are of approximately 14,000 tons displacement. Some of the vessels will be equipped with large refrigerated spaces for perishable cargo.

The corporation also has a contract to build rocket-launchers, a vital part of the U. S. Navy's newest and deadliest combat weapon, at their shipbuilding division at Orange, Texas.

Although censorship does not permit disclosure of the number and type of rocket-launchers to be built, it is expected that the figure will run into thousands.



The purse seiner, Cecelia, cutting through the water off Newport Beach. She was built at North American Shipbuilding Co. located at Newport Beach, California.

Consolidated is currently laying he keel for a new-design, streamned tug, for the Santa Fe Railroad. Inder an additional order from Santa e they are building a large barge or ar-float, capable of ferrying standard ailroad cars. The tug will be comleted in approximately three months. Designed for extreme flexibility and owered by steam, the tug will develop 1200 indicated h.p. The design of the vessel was worked out by he firm of Joslyn & Ryan, naval rchitects of San Francisco.

Both the new tug and the car-float vill be operated in the San Francisco Bay.

Large Vessel Disposal

Creation of the Division of Large Vessels Disposal and the appointment f Commodore E. J. Moran to head he new unit, was announced by the United States Maritime Commission nd the War Shipping Administraion.

This division will have charge of egotiations for the disposal of vesels and floating equipment in excess f one thousand gross tons.

The division will also make recomendations for the sale, receipts from nd transfers to other Government epartments and agencies with the xception of new construction, the eturn of vessels to owners from hom chartered, and the terms and onditions of such redeliveries.

COMPARATIVE IMPORT AND EXPORT TONNAGE TRANSPORTED BETWEEN PRINCIPAL PORTS OF THE UNITED STATES, BY AREAS, AND REPRESENTATIVE PORTS IN THE COUNTRIES INDICATED: FISCAL YEAR ENDED JUNE 30, 1937

(Figures are in tons of 2,240 pounds)

Country	Principal Ports, By Areas: Atlantic[1]	Gulf[2]	Pacific[3]	All United States Ports
Imports				
Philippine Islands a	503,239	119,941	219,805	848,981
China b	130,547	4,285	89,429	224,291
Japan c	289,087	4,175	218,688	514,731
Australia d	60,423	50	13,752	74,225
Malay States - East Indies e	604,136	48,704	68,266	726,646
India f	452,274	95,631	52,338	613,119
Exports, Excluding Petroleum Products, Paper Stock and Manufactures Thereof and Lumber (As well as Scrap Iron Destined to Japan)				
Philippine Islands a	197,154	1,518	111,409	312,601
China b	205,971	15,723	57,784	281,074
Japan c	351,015	236,945	180,985	984,626
Australia d	78,501	18,316	18,196	137,725
Malay States - East Indies e	73,263	5,130	11,136	91,332
India f	41,065	5,446	12,046	59,141

a Philippine Is. include
Manila
Iloilo
Cebu

b China includes
Shanghai
Hongkong

c Japan includes
Yokohama
Kobe

d Australia includes
Sydney
Melbourne
Brisbane
Adelaide

e Malay States-East Indies includes
Batavia, Java
Soerbaja
Belawan, Sumatra
Singapore, Malay St.

f India includes
Calcutta
Bombay

1 Atlantic Ports include
Baltimore
Boston
Newport News
New York
Norfolk
Philadelphia
Savannah, Ga.
Wilmington, N.C.

2 Gulf Ports include
Corpus Christie
Galveston
Houston
Mobile
New Orleans

3 Pacific Ports include
Los Angeles
Portland
San Francisco
Seattle
Tacoma

Source of data: Report No. 42-37 issued by U.S. Maritime Commission, Division of Research.

Below: Launchings at California Shipbuilding Corporation in December. Left: 400th ship launching party (left to right) Miss Margaret A. Sprunce, daughter and maid of honor; S. D. Bechtel; Commodore S. F. Heim, commander of Naval Operating Base, Terminal Island; John A. McCone; the sponsor, Mrs. Raymond A. Spruance, wife of Admiral Spruance, and H. C. Price, president of H. C. Price Company of Bartlesville, Oklahoma. Center: 400th ship ready for launching. Right: Mrs. Albert Mendelsohn about to christen the SS Jericho Victory, Mrs. Frank Day (at left), matron of honor, Albert Mendelsohn, president of Cananea Consolidated Copper Co. and an executive of Anaconda Copper Co., and Frank Day of Cananea, Sonora, Mexico.

















(1) USS Mellette, Oregonship attack transport.
(2) An LCS(L) being made ready for launching on the marine railway at Commercial Iron Works.
(3) SS Jericho Victory slides into Cerritos Channel from one of Colship's ways.
(4) Two high-ranking officers of the Chinese Army, Col. Li Fu Chang (left) and Lt. Col. Su Tou Chen, with Charles W. Gillis of the War Production Board, S. F., and Sherwood Holl of Marinship. This is the officers' first visit to an American shipyard.
(5) The sponsor's party of the SS Capitol Reef at Swan Island. Sponsor is Mrs. F. T. Boylan (center, front row), wife of the president of Consolidated Tile and Deck Covering, NYC (he is at left, front row); Peeking out of the flowers is Shari Kerr, flower girl, standing next to her mother. Several Hollywood actors and an actess are in the group. Andy Devine (top row); Anne Gwynne of Universal (just below); John Sutton, former actor, now Photographer 1st Class, USN. Others include Father James Fogarty of Portland University and yard officials and guests.

SOME PACIFIC COAST LAUNCHINGS

Launched From December 15 to January 15

California Shipbuilding Corporation
Wilmington, California

SS Andarko Victory, December 27
SS Taos Victory, December 29
SS Texarkana Victory, January 11

Commercial Iron Works
Portland, Ore.

AN 75, December 16
LCS (L) 90, December 17
LCS (L) 91, December 17
LCS (L) 92, December 22
LCS (L) 93, December 23
LCS (L) 94, December 23
LCS (L) 95, January 3
LCS (L) 96, January 6
LCS (L) 97, January 6
LCS (L) 98, January 13
LCS (L) 99, January 13

(Commercial Iron Works delivered 112 vessels of various types during 1944.)

Consolidated Steel Corporation, Ltd.
Long Beach, California

MS Lanyard Knot, cargo, December 18
MS Jumper Hitch, cargo, December 30
MS Square Knot, cargo, January 13

Consolidated Steel Corporation, Ltd.
Wilmington, California

USS Fergus (CT), December 24
USS Fillmore (CT), January 4
USS Garrard (CT), January 13

Kaiser Company, Inc.
Yard Three, Richmond, Calif.

USS General H. F. Hodges (C4), January 3

Kaiser Company, Inc.
Yard Four, Richmond, Calif.

USS Cabell (C1), December 23

Kaiser Company, Inc.
Portland, Oregon

SS Capitol Reef, December 5
SS Joshua Tree, December 8
SS Platt Park, December 13
SS Stones River, December 16
SS Fort Stanwyx, December 21
SS Fort Frederica, December 27
SS Saguaro, December 31

Marinship Corporation
Sausalito, California

Tanker Sunset Hills, January 7

Moore Dry Dock Company
Oakland, California

SS Water Witch (C-2), December 20
SS Contest (C-2), January 2

Te Permanente Metals Corporation
Yrd One, Richmond, California

6S Durango Victory, December 16
6S Devil's Lake Victory, December 22
pS Berkeley Victory, December 31
6S Halaula Victory, January 9

Te Permanente Metals Corporation
Yrd Two, Richmond, California

6S Massillon Victory, December 17
6S Hannibal Victory, December 21
6S Beatrice Victory, December 27
6S Virginia City Victory, December 31
6S Brigham Victory, January 4
6S Hobbs Victory, January 9
6S El Reno Victory, January 12

rge Cargo Ship Is Saved

A 23,000-ton cargo ship which was dy for launching at the end of 0, was saved from the Germans the action of Dutch patriots who, ough one subterfuge after another t the ship sitting on its ways at llissinger shipyard for four years. ship, complete with engines, was on the ways when the Allies lly drove the Germans from Wal-ren Island.

rom a few of the shipyard em-rees, Aneta, Netherlands News ncy, learned how the ship was rd. Many times, they said, Ger-committees came to Vlissingen tudy the ship's "possibilities," but patriots always circumvented its ching. Later, allied air supremacy e it impractical for the ship to launched and taken to Germany, he stayed in the yard, steadied shielded by concrete blocks in allied bombs should fall too near

v Tanker Contract

Marinship Corporation was recent-warded an additional contract for truction of nine merchant tank-to be built during the last half of 5.

his was the second contract for tional work announced by the salito shipyard in less than a th. Previously disclosed was a ract to build four more Navy s of a type built exclusively at yard.

his will make a total of 13 high-d tankers already contracted for truction and delivery in the sec-half of 1945, after completion of 27 tankers previously undertaken. These new contracts guarantee continued employment at Marinship at the present rapid pace at least until the end of this year.

The nine new ships will be 523 feet long and of the 6600 h.p. Hills class, powered by the most modern type of turbo-electric propulsion equipment. The hulls will be similar to 32 ships previously contracted, of which 12 have already been delivered.

16 Victories to Calship

The California Shipbuilding Corporation received from the Maritime Commission a $35,000,000 contract for construction of sixteen Victory ships on a lump sum basis, to be built after July 1, 1945, all ships to be delivered prior to December 31, 1945.

Vice-Admiral Emory S. Land, chairman of the Maritime Commission, wired McCone confirmation of the contract.

Kaiser Firm Gets First Pontoon Order

Officials of the Oregon Shipbuilding Corporation attach much importance to the recent awarding of a $12,000,000 contract for fabrication of 4000 aluminum pontoon units for the Army. Plant officials stated that the order marks the first opportunity for Northwest shipbuilding industry to take a place in the field of light metals fabrication.

The pontoons will be used by the engineer corps as floating bridges for transport of trucks, supplies and troops over streams in various theaters of war.

Army Adds Five More Ships to Mercy Fleet

Five more troop ships will be stripped of their armament and converted into United States Army hospital ships in order to insure speedier return of America's combat wounded, the War Department announced.

Addition of these new ambulance-type hospital ships will bring to 29 the number of such vessels operated by the Transportation Corps, Army Service Forces. The 29 vessels will have a total capacity of more than 18,000 sick and wounded.

Conversion of the new ships, which have a total capacity of 5355 patients, is expected to be completed in four months. They will take on their new coat of white paint, familiar red crosses and green bands and be ready for service by June or July.

The ships which are being converted are the Saturnia, a former Italian luxury liner, the former French liners Colombie and Athos II, and the former United States liners Republic and President Tyler.



VICTORY CHRISTMAS TREE

More than 75 feet above the Marinship yard, a colorful illuminated Christmas tree stood on the bow of the tanker SS Patrera Hills. The ship was recently launched. Thousands of motorists who passed the shipyard between dusk and dawn, as well as the many yard workers, will long remember this giant tree.

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
MARINE UNDERWRITERS
200 BUSH STREET . . . . . SAN FRANCISCO
Offices at: Calman Bldg., Seattle • 111 West 7th St., Las Angeles

SHIPYARD LABOR SHORTAGE?

An Editorial

Reviewing shipbuilding progress during 1944, two more leaders of the industry have stressed the serious labor shortage problem. "Man power continues to be the crux of production," declares Eugene G. Grace, president of the Bethlehem Steel Company. "The force in our yards has dropped during the year from 182,000 to 137,000," he says, "and many thousands of new employees have been trained; but thousands more men are needed to handle the production scheduled for the coming year."

Simultaneously, Lynn H. Korndorff, president of the Federal Shipbuilding and Dry Dock Company, states that: "Man power shortages which previously crippled the schedules of yards building ships for future military operations are still occurring, and the delays in shipbuilding threaten to endanger American counterblows and invasions unless stopped by immediate increases in shipyard man power."

Meanwhile the armed forces are drafting more and more men, and now are digging into the 300,000 farm employees of 18 to 26 years. While all this is going on, hundreds of thousands of able men in France —who can find no industrial work— are begging the United States to arm and supply them so that they can aid more effectively in driving back the Nazis.

Draft boards have taken many thousands of skilled men from American shipyards, engineering plants, mines, and other war industry establishments, regardless of the fact that in many cases soldiers have had to be given leave of absence and returned to industry. Today operating of our ships is held up through man power shortage; yet for many months, and until recently, the War Shipping Administration was not allowed to recruit men between the ages of 18 and 26. Indications are that the highest powers in Washington want to eat their cake and still have it. With so many Frenchmen willing to fight, a little common sense well applied should provide an effective solution to the labor problem. And a million Frenchman can't be wrong.

BOOK REVIEWS

The United States Maritime Service has recently published a 63-page information booklet. The booklet, which is profusely illustrated with photographs and charts, contains a brief history of the American Merchant Marine and the seamen who manned its ships, a description of the modern merchant marine and a detailed explanation of the United States Maritime Service, its training courses, basic qualifications, and upgrade courses. It is filled with pertinent information, and should make very valuable reading for anyone who is contemplating joining the United States Maritime Service.

"Tornado in a Box" is the title of a motion picture released by Allis-Chalmers Mfg. Co. It explains the development and operation of the gas turbine, newest source of prime power, and unfolds the story of the gas turbine in a manner which will make its principle readily understandable to the largest possible audience. The film, which contains no advertising, is being lent free to any industrial or engineering group interested in showing it, and permanent prints may be purchased. It is a 16-mm film for use on sound projectors only. To borrow or purchase "Tornado in a Box" or other Allis-Chalmers educational films, write the company at 650 Harrison Street, San Francisco 7, California.

POWER PLANT ON BD-1 TRANSPORTS

(Continued from page 76)

Emergency generator
Ring bus tie
Interior communication
Forward distribution
After distribution
Emergency diesel engine starti
motor controller
Battery charging and dischargin
Steering power transer

Propeller shaft turning gear a
paratus is connected to each ma
shaft in the shaft alley just aft
each propulsion motor. This app
ratus is powered by a 3-hp Westir
house gearmotor with an outp
speed of 4.4 rpm, which, when e
gaged, turns the propeller shaft
1¼ rpm. A specially designed loc
ing arrangement insures that t
turning gear will not be engag
when the main power is on. A pini
mounted on the end of the outp
shaft meshes with the turning ge
attached to the main shaft to enga
the gearmotor.

Steering gear equipment is of t
conventional hydraulic type, rated
25 hp, with an overload rating f
astern steering of 31.25 hp. Built
American Engineering Compar
Philadelphia, Pa., this equipme
provides a maximum ahead torq
of 1,590,000 inch pounds, and
working pressure, ahead, of 4
pounds pressure per square inch. T
rudder is rated to turn through
angle of 70 degrees from hardov
port to hardover starboard in
seconds.

Extensive use has been made
this vessel of Micarta—the Westir
house laminated phenolic mater
It was used for stern tube bearin
for cleats to support main elect
cables and for spacer blocks betwe
the walls of refrigeration and a
munition rooms.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

sch-Sulzer's President, rris H. Schwenk



Morris H. Schwenk ow serving as presi- t of Busch-Sulzer s. Diesel Engine npany, America's st builder of diesel ines. Mr. Schwenk med the duties of post in June, 1944. His record of suc- ful management policy planning is and imposing. He held high executive tions with the for- William Cramp & s, Ship and Engine ding Company and associated compa- , including Pelton terwheel Company. also served as presi- t of De La Vergne ine Company and president of Bald- Locomotive rks.

Mr. Schwenk has a brilliant and en- le record as an utive and his for- associates credit with the successful elopment of the ral companies that e under his management. These ous industries include heavy machinery businesses similar to that of Busch-Sulzer Company and have provided Mr. Schwenk with a comprehensive and adequate background.





Scenes of the head table at the San Francisco Propeller session when General Kells spoke. In this group we recognize (third from the left) Co. Thom Plant, Frazer Bailey, Dr. Henry F. Grady, General C. H. Kells, Fred L. Doelker, John Cushing, Hugh Gallagher, John Davidson and Eugene Hoffm

General Kells Addresses Propeller Group

The San Francisco Propeller Club held the December luncheon meeting in the Colonial Ballroom of the St. Francis Hotel on December 20.

President Fred L. Doelker presided and introduced the guest speaker, Brigadier General C. H. Kells, commanding general, San Francisco Port of Embarkation, at Fort Mason, who gave an excellent talk, accompanied by colored pictures, of the activities of the officers and men under his command. The colossal task being accomplished by these men was fully appreciated by the club members, as evidenced by their applause.

On conclusion of the general's talk, the publishers of Time, Life and Fortune magazines showed a preview of their latest March of Time film which was devoted entirely to dramatization of the American Merchant Marine and a projection of its post-war significance.



Illustration of one of the three Delta Line ships now under construction for a more luxurious and faster service between the Americas.









In this group of pictures, above is Brig. General C. H. Kells addressing the S. F. Propellers. Alongside and below are glimpses of those who were in the audience.



Left: Captain W. W. Hastings, supervisor of shipbuilding, USN, 12th Naval District, and Carl W. Flesher, regional director of U. S. Maritime Commission, at the J & R Christmas party.

Top right: Among those at the head table were (l to r): Michael Ryan, partner with Paul Joslyn, leading naval architects in San Francisco; Carl W. Flesher, and Captain W. W. Hastings.

Here is a glimpse of some of the merry-makers at this gala affair.





Blueprint of a Streamlined Party

Joslyn and Ryan hosted another ompletely successful Christmas party n December 22 for over 400 em- loyees and their guests at the St. rancis Hotel, San Francisco. The ntertainment was put on by the mployees and consisted of skits that atirized certain office situations and ersonalities, a choral group of 25 who sang Christmas carols by candle- ight, a male quartet, a violin solo nd a piano solo completed the pro- ram, which was emceed by Herbert tone.

Carl W. Flesher, regional director f U.S.M.C., gave an interesting alk in which he reviewed the ac- omplishments of the shipbuilding ndustry during the past year. Cap- ain W. W. Hastings, recently ssigned to the Twelfth Naval Dis- rict as supervisor of shipbuilding, as also present, as were several ther distinguished members of the Maritime Commission and shipbuild- ng industries.

Right: Paul Joslyn, Carl Flesher and Michael Ryan.

Lower right: Maritime Commission table (l to r): M. I. Blumenthal, USMC; George Rulofson, Brooks Equipment Co.; Jerry Fawble, USMC; Jim Baulck; Don J. Macaulay, Stow Mfg. Co.; Ed Swain, USMC; Del Howell, J & R; Kenneth R. Polly, USMC; Charles Boynton, J & R; and C. E. Bushnell, J & R.



Bottom, right: View of the gathering being amused by one of the humorous skits on the hectic life of a drattsman in war production.



Lower left: left to right: Moritz Jaehne, Paul Joslyn, with Earl S. Shulters, USMC technical assistant to the Regional Director. Holding the interesting tray is Sam Gazzano, personnel and public relations man for J & R.











Partners in a marine insulating firm are top: George H. Freear and below, Hal G. Lorentzen.

New Insulation and Deckcovering Partnership

George H. Freear is now in partnership with "Hal" G. Lorentzen, in the marine and shoreside insulation business.

George Freear was for a considerable time owner of the Van Fleet-Freear Co., which for many years installed much of the marine insulation work on the large ships owned by the San Francisco and Los Angeles shipping companies. During the past four years he was manager of the industrial insulation department of the Armstrong Cork Co., where he designed and supervised construction of refrigerated spaces and hull insulation on some 125 vessels, many of these being to the U. S. Navy requirements. Navy large shoreside refrigeration jobs also have been designed and supervised by him during his 30 years on the San Francisco waterfront.

Harold G. Lorentzen is well known in marine circles in the Bay Area, having been engaged in the deck covering business for the past 15 years.

He operates a staff of 125 men working on a variety of deck coverings, including safety decks, mastic and magnesite, and handles the job with the most modern equipment. In this industrial and commercial field he is in a position to lay many ty of composition flooring, includ the spark proof and heavy duty ty

The company's new head o and warehouse, all under one r and located in Oakland at 2 Broadway, is one of the most c plete of its kind on the Pacific Co The San Francisco office is at Hawthorne Street.

From Bosses to Bus Boys

The Bosses—top executives a department heads of the Josh Hendy Iron Works, Sunnyvale, C fornia, donned the white caps a robes of bus boys and waiters to ser dinner to several hundred employe as part of a recent 6th War Lo Drive stunt. Admission to the din was only by purchase of a $5 bond.

Charles E. Moore, president, we ing Waiter's Badge No. 1; Fe Kahn, company treasurer, acting Head Bus Boy, and General Mana Harry Gunetti, just a singing wait were the butt of most of the pran but the dinner paid off in more th a half-million-dollar bond sales.



The three famous bus boys, Felix Kahn, Charley Moore and Harry Gunetti ore shown when they were rung in by a magician on a fake drink gag. These bosses were the butt af most of the evening's pranks, including one which forced them into personally buying $26,000 in additional bonds.

Mariners Club Elects Tom Short

At the annual election and business meeting of the Mariners Club of California, held on January 3, new officers were chosen by the membership, as follows:

President .....Thomas A. Short
Vice President.....Fletcher Monson
Governors.....Commander A. T. Berry, Morse Frazier, Captain J. Edgerton and Frank De Pue

In our photo, Fletcher Monson of General Engineering & Dry Dock Co., batting for new skipper Tom Short absent on an Eastern voyage, takes over the symbolic ship's bell from retiring President Frank De Pue. Capt. A. T. "Tom" Hunter headed up the nominating group and reported the committee's deliberations to a members-only attendance.



Above: Grouped around the bell, a familiar sight to Mariners, are Fletcher Monsan, Captain Hunter and Frank De Pue.



At left: Thomas A. Short, the newly elected prexy of the Mariners Club for '45.

Steen Appointed By Amship

Appointment of John B. Steen, a veteran shipbuilding executive at 44, as operations manager of Amship Corporation, Alameda, Calif., has been announced by C. E. Strobel, vice president and general manager.

Steen's 26 years of shipbuilding experience covers ship construction, conversion and repair from apprenticeship at Newport News Shipbuilding and Dry Dock Co. in 1918, to his Amship post where he heads production. While an apprentice, the company awarded him a scholarship to the Virginia Polytechnic Institute at Blacksburg, Virginia. As an avocation, he studied law and is a member of the Virginia State Bar, as well as the Society of Naval Architects and Marine Engineers, and the Society of Naval Engineers.

Amship Corporation specializes in emergency repair and conversion work for the U. S. Navy and War Shipping Administration.



John B. Steen appointed operations manager at Amship.

Obit

Selden Wells, chief engineer of the Matson ship Maunalei died on December 27 in the Marine Hospital. He was aged 54 years and had been chief of the Maunalei for the past ten years.





Above: Perennial Secretary Eugene Hoffman (center) rehearses one of his inimitable Alabamy stories on Byron A. Pickard (left) and new prexy, Jos. Moore.

Left: newly-elected president of San Francisco Propellers is Joseph A. Moore, Jr. (left) shown here with Fred L. Doelker, who turns over the gavel after the organization's most successful year.

Right: Vice president-elect is Joseph Geary (right). Here he is telling junior past-president Fred about the Resolutions Committee of '41.



1945 Officers of Port of San Francisco

Farewell speeches and inaugural speeches were the major attraction at the January 17 meeting of the Port of San Francisco, Propeller Club of the United States.

Retiring President Fred L. Doelker turned the gavel over to the club's new helmsman, Joseph A. Moore, Jr., president of Moore Dry Dock Company of Oakland, and, as speeches were the order of the day, many were delivered.

Club Secretary Eugene Hoffman, introduced some 35 new members, which now brings the total membership to 376. Over 50 per cent more than last year.

The new president announced that D. N. Lillevand is to be General Chairman of the House Committee for 1945. On the House Committee with its various sub-committees are the following:

D. N. Lillevand, general chairman; Carroll Reeves, associate general chairman; Eugene F. Hoffman, secretary.

Arrangements: R. DeGorog, chairman; Captain Henry Blackstone, W. Edgar Martin, Vincent P. McMurdo, Joseph J. Robinson, Edward J. Schneider.

Reception: Edward H. Harms, chairman; Bernard N. De Rochie, C. M. LeCount, B. H. Parkinson, H. H. Pierson.

Attendance: George Swett, chairman; Ross C. Marble, Fletcher Munson, Robert D. Spear, and Captain Andrew Townsend.

Program: Harry W. Parsons, chairman; George V. Cooley, Byron O. Pickard, J. F. Marias, and R. V. Winquist.



Left: Pleased with the unanimous ballot for new skipper "young Joe" are: James Moore, Austin Sperry, Charles Bulotti and Joseph A. Moore, Sr.

Below: In this group: Jack Armes, assistant to the president, and George A. Armes, president of General Engineering & Dry Dock Co.; General C. H. Kells, Colonel Thomas G. Plant and Colonel J. R. Reilly.



S. S. President Tyler, Recipient of Two Awards



eremonies at Armed Guard Center (Pacific) Treasure Island, Dec. 8, in connection with award of art Director's Trophy and Port Director's Chartered Transport Trophy to SS President Tyler. eated (l to r): Lt. Comdr. J. H. Wholly, PD Office; Eugene Hoffman, American President Lines; /. J. Bush, v. p. American President Lines; Capt. J. H. Barnhart, Master; Lt. Comdr. Mark A. rayson, Naval Troop Officer, SS President Tyler; Commodore M. S. Davis, Port Dir. 12ND; Henry rady, president, American President Lines, and president, Chamber of Commerce, San Francisco; apt. W. F. Latrenz, asst. PD 12ND; Russell Lutz, executive v. pres., American President Lines; opt. W. Pearch, marine supt., American President Lines; Lt. Comdr. E. F. O'Neill, PD office; . Comdr. H. W. Beissner, Jr., PD office. Standing: E. D. Flaherty, Comdr., CO Armed Guard tr., Pacific; ChBos'n C. D. Benson; Lt. (jg) J. F. McMindes, Lt. G. Hamilton; Lt. W. W. Hall, Lt. omdr. C. F. Johnson, Choplain M. G. Beck, Lt.; Lt. (jg) S. W. Schember, all of the Naval Unit SS resident Tyler and Lt. Comdr. Thomas Macklin, executive officer, Armed Guard Center (Pacific), 'acific).

Bethlehem-Alameda Key Changes

W. M. Laughton, general manager of the Bethlehem-Alameda Shipyard, Inc., announces the following changes in organization, as of January 1, 1945:

Fred McLean, 25 years with the Bethlehem organization, is appointed assistant to the general manager. He has been manager of the yard since the summer of 1942, when the present company was incorporated and the yard was rebuilt in order to begin a contract for the construction of ten of the large P-2 Troop Transports for the U. S. Maritime Commission. This move will relieve Mr. McLean of many of the onerous duties of operations and permit him to devote time to problems of broader managerial scope.

Thomas C. Ingersoll is appointed manager of the yard succeeding Mr. McLean. Mr. Ingersoll joined the drafting department of the Bethlehem organization in 1936 at the San Francisco shipyard, advancing through various positions to his present appointment in the Alameda yard.

Robert D. White is appointed assistant to the manager of Bethlehem-Alameda. He joined the organization in 1940 as a shipfitter at the San Francisco yard and was transferred in January, 1944, to the Alameda yard, as assistant superintendent of shipfitting.

State Maritime Academy Alumni

The formation of a California Maritime Academy alumni association was announced January 2 by the academy at Vallejo. Alumni and families of alumni are urged to communicate with the superintendent, Captain Claude B. Mayo, U.S.N. All graduates of the academy are presently serving as officers in the U. S. Merchant Marine or the U. S. Navy, and information as to their present duties and station is sought.

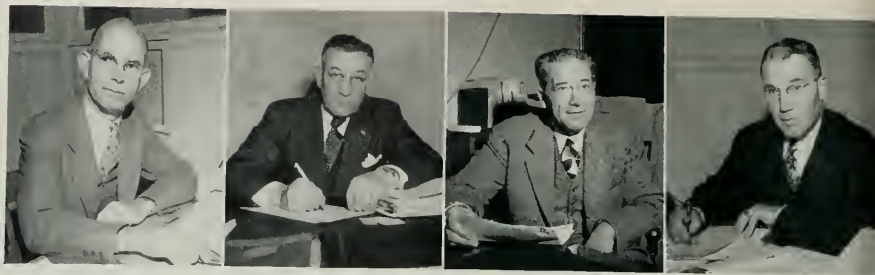
Established in 1929 by the State Legislature as a State educational institution, the California Maritime Academy trains young men to serve in the Merchant Marine as ship's officers. Because of it's importance to the shipping industry in peacetime, the academy became one of the mainstays in the training of wartime ship's personnel. A two year officer training course is given aboard the training ship SS Golden State, attached to the academy.

Appointment

The Metal and Thermit Corporation announces the election of John B. Tinnon and Walton S. Smith to the board of directors of the corporation.

Mr. Tinnon was appointed sales manager in 1928 and was made vice president in charge of sales in 1942.

Mr. Smith was general superintendent of the corporation prior to his appointment as vice president in charge of production in 1942.



Here are the men who head Johnson Specialty Company, we present (left to right): Wesley E. Bivens, office manager, San Pedro; Jay M. Besore, manager, San Francisco branch; A. Allen Johnson, general manager; and E. Alexander Johnson, sales manager, San Pedro.

L. A. Firm Opens San Francisco Office

The Johnson Specialty Company of Wilmington and San Diego has recently opened a branch office at 27-29 Pine Street, San Francisco, in order to serve the Northern California territory. **Jay M. Besore**, formerly with the Briggs Clarifier Co., is manager of this branch, in charge of all engineering.

A. Allen Johnson, the general manager of the company, well known in the marine engineering field in Southern California, has represented diesel engine and engineering specialty manufacturers since 1924 with offices in the Wilmington district. **E. Alexander Johnson,** who has been with the organization for some time, is sales manager with headquarters at the main office and warehouse of the company at 800-812 East Anaheim Boulevard, Wilmington. These three gentlemen comprise the partnership of the company.

A branch in San Diego, located at 2011-2023 Main Street, was opened in 1943 in order to give better service to the U. S. Navy and contractors in that vicinity. **Walter Doiron** is in charge of this branch.

Wesley E. Bivens is office manager at the main office in Wilmington.

The more prominent manufacturers represented in California by the Johnson Company are: The Briggs Clarifier Co., the Kraissl Co., Lister-Blackstone, Inc., R. H. Sheppard Co., Murphy Diesel Co., Kittle Mufflers, Kurz and Root Co., Walter Machine Co., Lang Manufacturing Co., Worthington Pump and Machinery Corp., Century Electric Co., and the Darcoid Co.

Other engineering specialties also carried are flexible couplings, gages, thermometers, diesel oil burners, convectors, vulcan radiators, heat exchangers, flexible metal hose, engine safety alarms, and Great Western cordage.

The company also maintains a rigging loft and is in a position to furnish nets, slings, fenders and special items to specifications in wire or rope.



Jahnson With Hurley Marine Warks

Jesse F. Johnson, chief surveyor of the Matson Navigation Company, San Francisco, commenced his new duties as general superintendent of the Hurley Marine Works, in Oakland, on January 3. He had been on the Matson Company staff for the past twenty years.

Farrel-Birmingham's Parkerton Visits Eastern Plants

Howard F. Parkerton, West Coast representative of Farrel-Birmingham Co., Inc., whose Western headquarters are located at 2032 S. Santa Fe Ave., Los Angeles, has returned from an extended visit to the company's plants in Ansonia, Connnecticut and Buffalo, New York. He conferred with John Haddock, president; Carl Hitchcock, vice president and sales manager; Lester Chirgwin, vice president and works manager in Buffalo and Austin Kuhns, vice president and executive engineer in New York. While at New York City he also visited the Brooklyn Navy Yard.

Southern California Propellers Welcome New Members

Outstanding among the meetings of 1944 was the holiday gathering of the Port of Los Angeles-Long Beach, No. 66, Propeller Club of the United States, with President Lee K. Vermille as the club's pilot.

First on the program, Captain George B. Gelly, U.S.G.G., captain of the port, Wilmington, introduced Lieutenant William Horton, who delivered an intensely interesting first-hand account of the Coast Guard on the European war zone loading and discharging of LST ships under fire. After his talk, a Coast Guard motion picture, "Serving the Merchant Marine", was unreeled. This film had its premier showing at the national convention of the Propeller Club and the American Merchant Marine Conference in New York last fall.

During the session, Admiral Albert Ware Marshall sought volunteers to spread the gospel of the American Merchant Marine before various service clubs throughout Southern California. Members to volunteer were many. Chaplain Jimmie Vaughter delivered an inspiring season's message interspersed with his humorously pertinent remarks.

Admiral I. C. Johnson received and introduced the following new members:

J. H. DRESSER, manager of fuel oil and export sales, Hancock Oil Co.; TED F. OSBORNE, Miller Freeman Publications; GEO. C. WALTHER, identification supervisor of L. A. Shipbuilding & Drydock Corp.; CAPTAIN G. B. GELLY, U.S.C.G.; MARTIN FAERBER, manager insurance and claims department, L. A. Tanker Operators, Inc.; CAPTAIN W. F. TOWLE, U.S.C.G., district Coast Guard Officer, 11th N.D.; W. S. RASH, JR., vice president, California Bank (credit supervisor, Harbor District); JOHN TUTAK, Port Area executive, United Seamen's Service; CAPTAIN G. W. D. DASHIELL, U.S.N. (Ret'd.), port director, Naval Transport Service; EWARD STUART, marine inspection officer, U.S.C.G.; ROLF MONSEN, administrative assistant, Todd Shipyards Corp.; OSCAR W. PEARSON, vice president, Marine Terminals Corp.; BERNARD GIBNEY, Pacific Coast manager, American West African Lines, Inc.; MARK OVERTON, L. A. Tanker Operators, Inc.; ARTHUR C. HUGG, district freight agent, traffic department, Southern Pacific Co.; JOSEPH E. BACKBURN, general agent, Pacific Electric Co.; S. T. SMITH, safety director, Consolidated Steel Corp.; P. C. LAMB, manager, marine department, Richfield Oil Co.; WALTER JOHANSING, sales engineer, Cardox Western, Inc.; and V. A. PETERSON, district manager, Elliott Company.



Lee K. Vermille, president of The Propeller Club of the United States, Port of Los Angeles-Long Beach, Port No. 66. Mr. Vermille is an attorney with Overton, Lyman & Plumb, 727 W. 7th Street, Los Angeles.

After Edgar Wilson, of American President Lines, indicated the great interest of the wounded soldiers at Birmingham Army Hospital, Van Nuys, California, in the **Infantry Journal** (heretofore only two copies of this magazine being furnished the hospital) many members present rose to the occasion with a total of 24 annual subscriptions collected. The following list is of names of the donors:

American-Hawaiian S.S. Co.
F. A. Hooper
American West African Line
B. Gibney
Citizens National Bank
W. Schroeder
Hammond Lumber Co.
James Smith
Hancock Oil Co.
B. H. Dresser
Luckenbach S.S. Co., Inc.
E. A. MacMahon
Moore-McCormack Line
L. Archer
Stow Manufacturing Co.
J. Henry
Transmarine Navigation Corp.
M. G. Linder
Wilmington Transportation Co.
H. Connor
American President Lines, Inc.
E. M. Wilson
Case Construction Company
Mr. Kellenberger
The De La Rama S.S. Co., Inc.
Hugh Middleton
General Electric Co.
H. K. Winterer
Interocean Steamship Corp.
W. F. Wilkinson
McCutchen, Thomas, Matthew, Griffiths & Greene
Harold Black
Matson Navigation Co.
R. J. Chandler
Todd Shipyards Corp.
Rolf Monsen
Union Oil Co.
Captain L. Lishman
M. A. Richley (An Individual)

McCORMICK WINS "T" PENNANT

Proudly these McCormick Steamship Company men display the Treasury Department "T" flag. This is the first steamship company to receive this flag which was awarded to the crew on the SS George H. Powell. They subscribed over 10 per cent of the total wages of the ship's payroll with 90 per cent of the crew participating in the purchase of War Bonds. Left to right: George Shrieve, purser, SS George H. Powell; E. H. Harms, operating manager, McCormick SS Company; G. H. Bushnell, asst. operating mgr, McCormick SS Co.; and Capt. L. A. Larson, SS George H. Powell.



ON THE WAYS

(Continued)

The 1944 Shipbuilding Record

With delivery of 145 merchant ships of 1,361,908 d.w. tons during the month of December, merchant shipyards in 1944 have turned out 1677 ships with an aggregate of 16,348,446 d.w. tons.

Of the 1677 ships delivered, 580 of them were turned over to the Army and Navy for military use. These included 209 merchant type ships turned over for military account and 371 built as military types.

A number of minor type vessels, tugs and barges were built in Maritime yards for military account. Also, turned out were 36 C1-M-AV1 coastal cargo ships operated by the WSA for military account.

When we analyze the production, 1944 was a better shipbuilding year than the record year of 1943 when 1896 ships of 19,238,626 d.w. tons were delivered. In many of the conversions to military types the deadweight tonnage was cut in half and the building time was doubled. In other words, a Victory hull completed as a cargo carrier would be 10,800 d.w. tons, but the same Victory hull completed as an APA for the Navy would be listed with half that much deadweight tonnage and would take considerably longer to build.

A comparison of the "light ship" displacement built during 1943 and 1944 and the average number of workers on Maritime Commission contracts reveals that each employee completed an average of 10.1 tons in 1943 and 11.5 tons in 1944, an improvement of 13 per cent. Considering the added complexity of outfitting this improvement is excellent.

A breakdown of the 1944 merchant ship construction, including minor types not previously announced, follows:

Shipyard	Type	Deliveries Dec.	Total 1944
Alabama, Mobile, Ala.	T2-SE-A1	4	44
American, Cleveland, O.	Military Type		5
American, Lorain, O.	Military Type		6
Anacortes, Anacortes, Wash.	BS-G1		1
Arlington, Jacksonville, Fla.	V2-M-AL1		4
Avondale, Westwego, La.	N3-S-A2		6
Barrett & Hilp, San Francisca, Cal.	B7-D1		13
Bethlehem-Alameda, Alameda, Cal.	P2-SE2-R1		3
Bethlehem-Fairfield, Baltimore, Md.	EC2-S-C1	..	114
	VC2-S-AP2	8	16
	C3-S-A3	1	5
Bethlehem-Sparraws Point, Md.	T3-S-A1	..	9
	Private Tanker	..	1
	EC2-S-C1	..	31
Calshia, Wilmington, Cal.	VC2-S-AP2	.....	.....
	VC2-S-AP3	.....	32
	Military Type	10	23
Columbia River, Astoria, Ore.	BS-G1	.....	3
	B7-A2	.....	6
Concrete Ship, Natianal City, Cal.	BS-BJ1	.....	22
	BS-BJ2	.....	3
	BS-BJ3	.....	..
	C1-B	.....	18
Cansalidated, Wilmingtan, Cal.	C1-S-AY1	..	6
	C1-M-AV1	1	1
	Military Type	5	29
Carpus Christi, Carpus Christi, Tex.	V3-S-AH2	.....	..
Delta, New Orleans, La.	EC2-S-C1	6	60
	Z-ET1-S-C3	.....	5
East Coast, Bayanne, N.J.	T1-M-A2	4	23
Eureka, Eureka, Cal.	V2-M-AL1	.....	6
Federal, Kearny, N.J.	C2-S-B1	1	8
	P2-S2-R2	.....	5
Froemming Bros., Inc., Milwaukee, Wis.	C1-M-AV1	1	5
	Military Type	.....	2
General Finance, Chicago, Ill.	S1-BG1	.....	1
General Ship, East Baston, Mass.	V4-M-A1	.....	2

TYPE SYMBOLS

C1, C2, C3, and C4 are dry carg carriers.

EC2 designates Liberty emergenc cargo vessels.

Z-EC2 indicates Liberty ship hul converted to tank and aircra (boxed) carriers.

Z-ET1 indicates Liberty ship hu converted to tanker.

VC2-S-AP 2-3 are Victory desig cargo carriers.

T1, T2, T3 indicate tankers.

N3-S-A2 vessels are coastal carg carriers.

C1-M-AV1 vessels are dry carg carriers for Pacific Island use.

B3, B5, and B7 are symbols ind cating barges.

Letter V indicates a tug.

R preceding the rest of the lette in the symbol indicates a refrigerate cargo ship.

Compensation

Sale of a 16,582 d.w. tons tanke SS Pure Oil, now under construc tion for the U. S. Maritime Com mission, was recently announced. Th purchasers are the Pure Oil Com pany, Chicago, and its subsidiary, th Sabine Transportation Company, Inc Port Arthur, Texas, which receive trade-in allowance of $1,300,500 c three obsolete tankers on the est mated price of $3,009,000 for th new vessel.

The purchased tanker is of th Maritime Commission's T3-S-A1 typ and is being built at the Bethleher Sparrows Point Shipyard, Baltimor

Calship Returns to 3 Shifts

Calship workers, resuming Victor ship construction after five montl of Navy troopship building, on Ja 8, 1945, returned to the 8-hour, shift day which was changed ter porarily last August 21.

The urgent troopship work at Ca ship has been completed and the yar is now building Victory ships, th Maritime Commission's new standa wartime and post-war cargo carrier

With the return to the 8-hou shifts, the Calship payroll will lev off at 27,000 by the end of Januar officials of the shipyard announce That figure is 5200 below the yarc recent payroll.

Globe, Superior, Wis.	C1-M-AV1	1	S
	Military Type		8
Gulf, Mobile, Ala.	C2-S-E1		7
Ingalls, Pascagoula, Miss.	C3-S-A2	2	15
	N3-S-A2		6
J. A. Jones, Brunswick, Ga.	EC2-S-C1	7	53
J. A. Jones, Panama City, Fla.	EC2-S-C1	4	51
	Z-EC2-S-C2		2
Kaiser Co., Richmond No. 3 Richmond, Cal.	C4-S-A1	1	14
Kaiser Co., Swan Island, Portland, Ore.	T2-SE-A1	7	64
Kaiser Cargo, Richmond No. 4, Richmond, Cal.	C1-M-AV1	2	7
	Military Type		10
Kaiser Co., Vancouver, Wash.	Military Type	6	61
Leathem D. Smith, Sturgeon Bay, Wis.	C1-M-AV1	1	S
	Military Type		6
Marinship, Sausalito, Cal.	T2-SE-A1	4	12
	T2-SE-A2	1	32
	V2-M-AL1		3
Marinette, Marinette, Wis.	B7-A1		7
MacEvoy, Savannah, Ga.	C2-S-B1	1	35
Moore Dry Dock, Oakland, Cal.	C1-S-D1	2	22
McCloskey, Tampa, Fla.	EC2-S-C1	10	100
New England, South Portland, Me.	C2-S-AJ1		27
North Carolina, Wilmington, N.C.	C2-S-AJ2		S
	C2-S-AJ3	6	28
	EC2-S-C1		11
Oregon Ship, Portland, Ore.	VC2-S-AP3		32
	Military Type	4	30
Pendleton, New Orleans, La.	V4-M-A1		1
	N3-S-A2		4
	N3-S-A2		9
Pennsylvania Shipyards, Beaumont, Tex.	R1-M-AV3	2	3
	C1-A	1	17
Permanente, Richmond No. 1, Richmond, Cal.	EC2-S-C1		16
	VC2-S-AP2	5	14
	VC2-S-AP3		10
	VC2-S-AP2		101
Permanente, Richmond No. 2, Richmond, Cal.	Military Type		
	C1-A	4	22
Pusey & Jones, Wilmington, Del.	V3-S-AH2		6
Puget Sound, Olympia, Wash.	B3-F1		5
Richmond, South Gardiner, Me.	EC2-S-C1		2
St. Johns River, Jacksonville, Fla.	EC2-S-C1	5	51
Southeastern, Savannah, Ga.	B3-F1	4	44
Sea Bell, Seattle, Wash.	V2-M-AL1		2
Siletz, Kernville, Ore.	EC2-S-C1		2
Standard, San Pedro, Cal.	V3-S-AH2		8
Steinbach, Tillamaak, Ore.	V2-M-AL1		3
Sun Shipbuilding, Chester, Penn.	T2-SE-A1	7	69
	C4-S-B2	1	12
	B4-BX1	11	35
Texas Shio, Houston, Tex.	V2-M-AL1		7
Todd-Houston, Houston, Tex.	EC2-S-C1	8	83
	T1-M-A1		5
	T1-M-A2		4
Walsh-Kaiser, Providence, R.I.	Military Type	3	25
	EC2-S-C1		S
Walter Butler, Duluth, Minn.	N3-S-A2		8
	C1-M-AV1	1	6
Walter Butler, Superior, Wis.	Military Type		6
	C1-M-AV1	2	7
Waterways Engineering, Green Bay, Wis.	B3-F1		2
Welding Shipyards, Norfolk, Va.	T3-S-B1		3
	T3-S-BZ1		1
Western Pipe & Steel, San Francisco, Cal.	C3-S-A2	2	12
		156	1786
		(1,361,908 dwt.)	(16,447,300 dwt.)



USS General C. H. Muir, launched from Kaiser Company's Yard Three in Richmond, California.

Coast Guard Shield Awarded Marinship

For plant security activities "over and above accepted requirements," the United States Coast Guard conferred the Coast Guard Security Shield of Honor on Marinship Corporation, operators of the large tanker shipyard at Sausalito, California, on January 4.

Presentation was made personally by Commodore Philip F. Roach, commanding Coast Guard forces in the Twelfth Naval District, to K. K. Bechtel, president of Marinship Corporation, at a lunch-time program held in the presence of several hundred supervisory employees of the Marin County shipyard, at the Marin City dormitory auditorium.

Merchant Seamen Toast RAF Fliers

Hailing the sinking of the Tirpitz by Royal Air Force fliers, American merchant seamen, veterans of the dangerous Murmansk run, who feared the great German battleship far more than submarines and planes, staged a celebration on November 13 at the Andrew Furuseth Club in New York City.

Among the guests of the seamen were 25 RAF fliers. The British were all men who have flown over the coast of northern Norway and the hazardous sea lanes to Russia. Leading them was Flight Leader Denis Sutton of London.

MARINE EXCHANGE ACTIVITIES

By M. A. Cremer

Membership Directory

Because of numerous and urgent requests, a classified directory of members is now being prepared and should be in the mail during the present month.

The directory will contain names of members, names of officers of firm members, street addresses, postal zones and telephone numbers.

It should prove to be of considerable help to those seeking sources of supply, as well as steamship companies, shipyards and others who prefer to favor, wherever possible, those who are supporting the Marine Exchange through membership.

New Members

Applications for membership have been received and accepted from the following:

Acme Breweries
Atlas Heating & Ventilating Co.
Bushnell Controls & Equipment Co.
Arthur J. Fritz Co.
L. J. Hanrahan Co.
Hercules Equipment & Rubber Co.
Jensen Instrument Co.
Vic Knudsen
Dan P. Maher Paint Co.
Nelsen & Jorgensen
E. M. O'Donnell Copper Works, Inc.
Pacific Heating & Sheet Metal Co.
George M. Philpott Co.
Republic Electric Co.
Stapleton-Smith Sales Co.
Vacuum Sterilizing Co.

Exhibits

The Museum of Science and Industry is now displaying on the Exchange Floor the large model of the five masted, square rigged Preussen, and other items.

Additional exhibits are being secured.

The museum now plans to re-establish, as soon as conditions permit, a large marine exhibit in the building at Aquatic Park.

Bay Area Maritime Committee

At a joint meeting of the twelve-County Bay Area Maritime Committee and the San Francisco Junior Chamber's marine committee, Henry F. Grady, Phil A. Hoyt and O. C. Hansen emphasized the need for area-wide support of a greatly increased post-war volume of world trade for Northern California.

Grady stressed the need for business men to know what is going on in other countries of the Pacific Area. He urged more reading of the news covering business and related activities abroad. In speaking of the need for future financing of rehabilitation and development, he said that even if this is a national problem, much of the financing can be funnelled through here if we are alert to our opportunities.

Hoyt, who is executive vice president of Oliver United Filters and chairman of a Bay Area foreign trade committee, asserted that we must influence more of the companies located here to handle their exports here. He said that 70 per cent of the country's export business is handled in New York. He pointed to the activities of New Orleans and other gulf ports in working together on a program to sell the Middle West on exporting through the gulf. Part of this program, he said, consists in encouraging Middle West manufacturers to handle their own exports instead of having it handled for them in New York.

Hoyt declared that there was a great need for world trade publicity as well as more world trade news. He urged a campaign to sell companies in this area on studying export possibilities.

Hansen placed emphasis on publicizing San Francisco's world trade, not only here but before the world and suggested as a means to that end the preparation and distribution abroad of a directory of world trade of Northern California. He assert that Los Angeles has been doing th for 25 years. Such a directory, said, should include not only expo ers and importers, but bankers, i surance firms, forwarders, and other allied world trade organiz tions. He pointed out that it wou be easy to prepare such a directo for San Francisco alone, but that would not be representative Northern California. He asked f cooperation of other chambers commerce in assembling directo material.

Hansen stated that one of the be evidences of growing Bay Area unit is the endorsement given by 25 chan bers of commerce in the area to th World Trade Center. He gave fu credit for these endorsements to th Bay Area Maritime Committee.

Oakland's C. of C. New Helmsman

Gerald H. Hagar, attorney-at-la and senior member of the legal firm of Hagar, Crosby and Crosby, ha assumed his duties as president of th Oakland Chamber of Commerce succeeding President P. D. Richard son, vice president and manager o the Bank of America.

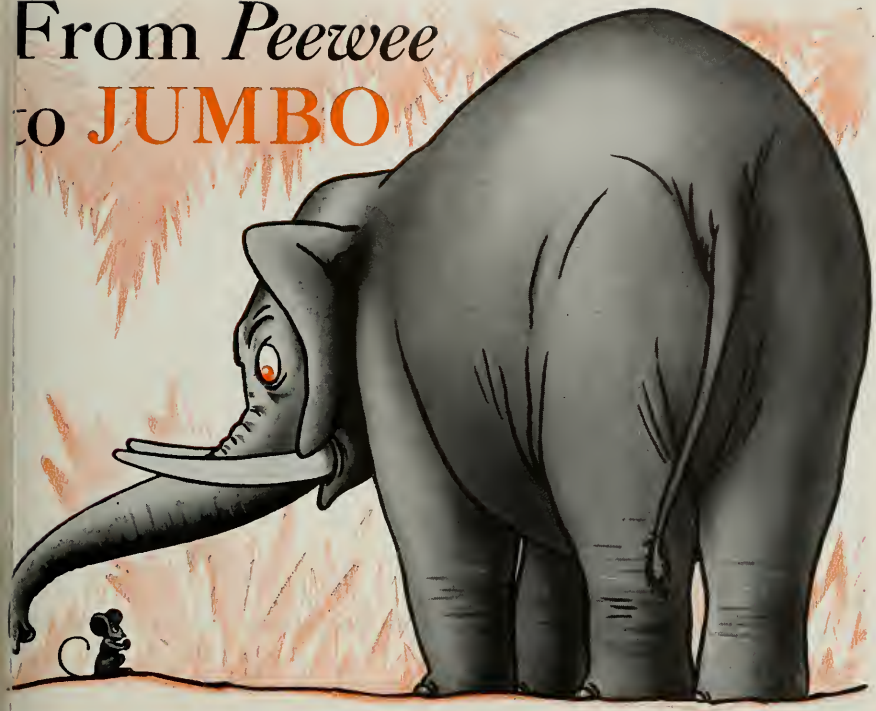
Serving with President Hagar duri in 1945 will be Vice President Louis J. Breuner, president, Joh Breuner Company; Orton Lucas, ger eral manager, Hale Bros., Oakland and Edgar B. Jessup, president, Ma chant Calculating Machine Company

Republic Industrial Appoints Three Officials in Los Angeles

R. L. Temple, vice president i charge of sales, announces that th Republic Supply Company of Cal fornia, which recently combined i industrial division with the Hack Pipe & Supply Company and is no known as Republic Industrial, Inc has appointed R. L. Temple as vi president in charge of sales, F. Barney as vice president, and F. Kelly as merchandise manager.

Republic Industrial, Inc., wit offices and warehouses located 1725 E. 7th Street, Los Angeles 2 merchandises a complete line marine and industrial supplies inclu ing marine and industrial wire rop slings, riggers' supplies, mechanic rubber goods, pipe, valves ar fittings for regular and corrosi services.

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WHATEVER your welding fitting requirement, your Tube Turns distributor can meet it from the complete line of Tube-Turn welding fittings. Between the tiny half-inch and the giant thirty-inch fittings the Tube Turns line includes over 4,000 items.

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Back of his own organization, and ready to help with any unusual situation, stands the staff of the nearest Tube Turns district office, backed—when need arises—by the complete resources of the Tube Turns headquarters in Louisville. Write today for your free copy of Tube Turns Catalog No. 111, a valuable handbook of welding fittings information. TUBE TURNS (Inc.), Dept. PM-2, Louisville 1, Ky.

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TUBE TURNS (Incorporated) LOUISVILLE 1, KENTUCKY, Branch Offices: New York, Chicago, Philadelphia, Pittsburgh, Cleveland, Dayton, Washington, D. C., Houston, San Francisco, Seattle, Los Angeles.



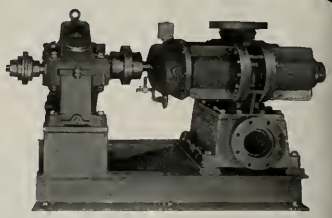
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Engineered for below deck service, this rotary positive displacement cargo pump gives continuous, non-pulsating delivery, reducing vibration to a minimum. Available with or without reduction gear, for Diesel engine drive. Write for Bulletin 18.



Kinney Heliquad Pump with reduction gear.

Table of Specifications: Kinney Model HQAC Cargo Pumps

Pump Size	Max. Recommended Speed	Average Capacity* at Max. Recommended Speed		Average Speed	Aver. Capacity* at Average Speed		Pressure Rating at		Size of Connections	
		Bbls. per Hour	Gals. per Min.		Bbls. per Hr.	Gals. per Min.	Max. Speed	Average Speed	Suction	Discharge
HQAC10531	620	750	525	525	615	430	100	140	6	6
HQAC10631	620	900	630	525	750	525	100	110	6	6
HQAC12631	460	1000	700	400	850	595	145	170	8	6
HQAC14731	375	1250	875	325	1070	749	125	160	8	8
HQAC16831	350	1800	1260	300	1500	1050	150	165	10	10
HQAC201031	310	3000	2100	275	2600	1820	130	150	12	12

Note horizontal suction base has built-in strainer, with connection at either side. Pump cylinder is separate and bolted to suction base, which permits removal of working parts without disturbing suction piping.

*Note: Capacities in table are based on 75 lbs. working pressure for gasoline or 125 lbs. for water and kerosene. For heavier liquids the capacities shown will be delivered at reduced speeds or increase in capacities can be obtained at the speeds shown. During stripping periods, it is recommended that speeds be decreased to suit the operating conditions. With pump located so that volatile liquids are pumped under suction lift, the capacities shown are subject to reduction depending upon the amount of liquid vaporized under the operating conditions of vacuum, temperature, etc.

We also manufacture **Rotating Plunger Pumps, Vacuum Pumps, Vacuum Tight Valves, Clutches and Bituminous Distributors.**

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Hot off the Press

Ilg Research Laboratory is a colorful, eight-page brochure featuring the Ilg Electric Ventilating Co.'s Research Laboratory in Chicago. Devoted to the scientific study of air, this new laboratory makes available to engineers, scientists and laboratory technicians the most modern methods in air research.

Air Operated Clutch, a four-page broadside in two colors by Pacific Car and Foundry Company, Renton, Washington, which describes their new caromatic clutch which is to have priority in their post-war production planning. This clutch has compactness, safety, long life, ease of remote control, simplicity of operation, and low maintenance costs. It can be built to meet any capacity requirements.

Condenser Tube Inlets, Flowrites, describes short belled-end metal inserts which protect condenser tube inlets against erosion, and are furnished by Condenser Service & Engineering Co., Inc., Hoboken, N. J. Flowrites, because of their peculiar shape, create a venturi action which reduces fluid friction by over 80 per cent. The smooth flow of fluid prevents release of gases which cause pinholes in the tubes.

"Oil Burners," bulletin No. 802 by the Peabody Engineering Corp., New York. It describes and illustrates the mechanical and operating features of the type M oil burner for natural or forced draft operation and for use with mechanical, wide-range mechanical or steam atomizers.

Wire Rope in the war is well presented in a 36-page book by Preformed Wire Rope Information Bureau, Chicago. Ninety interesting photographs illustrate 80 uses of wire rope.

"Deaerating Feed Tank Instruction Manuel NH-500," by the Marine Department, Elliott Company Jeannette, Pa., is a 30-page handbook of illustrations, tables and charts on the design and purpose of deaerating feedwater heaters. The book is designed to give an operator a general idea of theory, operation and maintenance.

Leonard Precision Products Co Garden Grove, California, has available a folder describing the new completely automatic Leonard Tube Master for squaring, burring, flaring and beading ferrous and non-ferrous tubing, sizes 1/8" to 3" O.D.

"Far-Air Filters" is the title of bulletin describing and illustrating a new type of air filter in designs for all industries. This bulletin, published by the Farr Company, Los Angeles, Calif., contains technical information and graph charts valuable in any filter problem.

"Krane Kar" catalog No. 58 by Silent Hoist Winch and Crane Co. Brooklyn, N. Y., contains 24 pages 74 photographs and diagrams, all factual, concise specifications.

(Please turn to page 70)



MARQUETTE

HYDRAULIC GOVERNORS AND OVER-SPEED TRIPS





For Diesel-electric and Direct Propulsion Installations



The Marquette

METAL PRODUCTS CO.

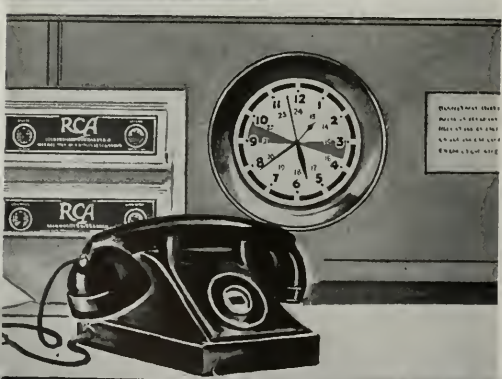
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FOR EXCELLENCE







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In normal times, ships of a nations navigating the seve seas handle thousands of radi telegrams to and from all part of the world through Radio marine coastal stations along the Atlantic, Gulf, an Pacific Coasts of the United States. Vessels travers ing our inland waters are similarly served by Radio marine radio telegraph and radio telephone shor stations on the Great Lakes and on the Mississipp

All these stations have direct connections wit national and international telegraph, telephone, an radio systems, thus assuring fast, efficient throug communication service at all times.

In addition to their message service, Radiomarin shore stations maintain continuous watch for distres signals from the sea and are ever on the alert t render aid to distressed vessels when disaster strike These stations also broadcast weather reports for th benefit of ships' navigators and transmit daily new bulletins for the information of those who "go dow to the sea in ships."

When war restrictions on maritime communica tion are lifted, no vessel equipped with modern lon range Radiomarine apparatus need ever be out touch with the home office or with friends and rel tives ashore. Radiomarine Corporation of Americ 75 Varick Street, New York 13, N. Y.



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AND

HARRON, RICKARD & McCONE COMPANY OF SOUTHERN CALIFORNIA

OF

LOS ANGELES

Hot Off the Press

(Continued)

"Circuits For Victory" is a 40-page booklet depicting communications' role in modern warfare. Distributed by Western Electric, N. Y., it features a chart in four colors revealing in highly simplified form the interrelation of military and naval communications units.

"Handy Conversion Chart and Price List," covering fractional horsepower V-belts, issued by the B. F. Goodrich Company, Akron, Ohio. It gives the size and conversion data on standard section belts for motors under one hp.

"Electrical Signals" is a new 103-page catalog recently published by Faraday Electric Corporation, Adrian, Mich. Clearly illustrated and carefully indexed, it contains a section on good signaling which helps the buyer to select the proper type of signal, as well as interesting facts about sound measurements.

A four-page bulletin, No. 21, entitled **"Meehanite — the Metal for Heat Resisting Castings,"** has been prepared by the Meehanite Research Institute of America, Inc., New Rochelle, N.Y. This bulletin illustrates typical applications of various special heat resisting Meehanite castings and also tabulates various property data.

"Industrial Truck Safety Rules" is a new, convenient, pocket-sized edition of 34 safety rules. Applicable to all makes and types of power industrial trucks, this booklet is published by Elwell-Parker Electric Company, Cleveland, Ohio.

"Rechargeable Flashlight Battery," a six-page catalog section by The B. F. Goodrich Company, Industrial Production Division, Akron, Ohio, on its recently introduced wet storage battery for flashlights.

Superior Flux Company of Cleveland, Ohio, has recently made available its Catalog No. 44, a complete description of the company's soldering, welding and brazing fluxes for both ferrous and non-ferrous metals and alloys.

"Fuel Oil Burning Ranges," an eight-page, profusely illustrated brochure (Bulletin No. 200B), recently published by Preferred Utilit Manufacturing Corp. of New Yor describes their modern marine coo ing ranges, bake ovens, and wat heaters, together with accesso equipment.

"Airco Acetylene Generators," new bulletin by Air Reduction, Nc York, features the new Airco Ty "P" Portable Generator, incorpor ing an "air lift" water circulati system and enlarged radiation spa between the carbide hopper a water level, providing cooler, doub scrubbed gas.

A new brochure has recently be released by Western Asbestos C San Francisco, entitled **"Products a Services."** A handy reference bo for data on insulation, sound con tion, and asbestos-cement product

Gotham Instrument Co., Nc York, manufacturers of dial, indic ing, industrial, recording and cc trolling thermometers, has availal a new edition of its illustrated ca log No. 45, with much valuable i formation, including specificatio ranges and temperature conversi tables.

(Please turn to page 88)

The navy had a tough problem:



. In 1940 and early 1941, the U. S. Navy had he problem of getting hundreds of patrol and escort essels built—*almost overnight.* But who could build hem? The big shipyards were working to capacity n big ships. The Navy outlined the problem to the nall shipyards. And . . .



The small shipyards took it on:

• **Many small yards** had gone practically out of usiness. Others had been building a few small non-ilitary craft, or were engaged only in repair work. quipment had deteriorated, skilled workers had left. ut small shipyards all over the country accepted the challenge. You bet they could build PC's, YN's, YT's, YMS's—*and in a hurry!*

Yards were rebuilt. New equipment was installed. Skeleton forces mushroomed. Keels were laid—*speed* was the thing! And yard managements were swamped with the thousands of details relating to construction of unfamiliar types of ships. It was a tough problem. And Sperry feels deep satisfaction that . . .



Sperry service engineers helped solve it:

3. Sperry equipment—including Electro-Mechanical Steering Systems and Gyro-Compasses—was going into many of these new ships. *And Sperry service engineers helped solve the problems encountered in engineering this equipment into the ships.*

In visiting scores of yards tucked away in small coastal harbors and tidewater inlets, the Great Lakes and the Ohio and Mississippi rivers, Sperry men found that they could be of help on many another problem. "What about this gear box? What about that quadrant arrangement? Or this rudder bearing?"

Sperry service men were, in effect, roving consulting engineers to an industry which tackled a mighty tough assignment and accomplished it despite tremendous odds. Sperry's years of familiarity with Navy and Marine problems helped many a shipyard meet its tight schedules.

• *The small shipyards met our Navy's challenge. Today, patrol and escort vessels by the hundreds are ridding the seven seas of submarines, and are clearing lanes through mine fields to invasion beaches.*

Sperry Gyroscope Company INC.

GREAT NECK, NEW YORK • DIVISION OF THE SPERRY CORPORATION

GYROSCOPICS • ELECTRONICS • AUTOMATIC COMPUTATION • SERVO-MECHANISMS



Master of the SS Thomas Hart Benton and his Honorary Crew (left to right), Mrs. Raye Wilson, skipper; Harman Gerken, Bos'n; David Osteyee, Radio Officer; Gwendolyn Whiteford, first officer; Mrs. E. N. Babb, chairman of "Adapt a Ship" plan of the Women's Organization for the American Merchant Marine; Constance de Curtani, purser; Captain E. N. Babb, master of the ship adopted; James Case, scullian; Gloria Delucchi, second officer; Patricia Goodrich, baker; Diane Bauchou, chief cook; Dominic Patane, cadet engineer; Fred Clauson, first assistant engineer; Robert Faehr, third officer.

"Adopt a Ship"

The SS Thomas Hart Benton, under the command of Captain E. N. Babb, has been adopted by the Frank McCoppin School of San Francisco. Behind this "Adopt a Ship" campaign is the Women's Organization for the American Merchant Marine, Port of San Francisco. The aim of the plan is to assign an honorary crew from the students of the school and thus teach the youth of America the necessity of maintaining an adequate American Merchant Marine. This project was originated in New York some eight years ago, and has proved very successful in that it stimulates an interest in the world's geography and history as well as instructing them in the activity of the nation's Merchant Marine. It encourages correspondence between schools and masters of various vessels adopted, thus affording the children first hand information from experienced seamen of the intricacies of marine operations, cargo handling and information regarding distant parts of the world. It is hoped that more schools of the Bay Area will take up an interest in this plan.

Robt. Owens, Master

Twenty-four-year-old **Lieut. Commander Robert Owens,** San Mateo, reached the top rung in the U. S. Merchant Marine ladder early in January, when he obtained his master's papers.

Owens, now licensed to command vessels of unlimited tonnage, graduated from the California Maritime Academy as third mate in 1941 and has served on the Matson Line's Mariposa since that time. Last March, Owens, at the age of 23, was made first mate on the Mariposa, becoming the youngest first officer on a ship of that size.

Commander Owens is the third generation of his family to enter the merchant marine. His father, A. J. Owens, is operating manager of Sudden & Christenson Steamship Company, San Francisco.

Moore's "M" Pennant

An award by the U. S. Maritime Commission of a second gold star to be added to the Moore Dry Dock Company's "M" pennant was announced by Joseph A. Moore, Jr., president of the Oakland shipbuil ing plant.

Admiral Emory S. Land in a tel gram informed company officials o the award, presented "in recognitio of continued outstanding productio achievement in ship construction."

Announcement of the addition honors for the Oakland shipyar followed only a few days aft workers there had set an all-tim record for speedy and efficient co struction of a C-2 cargo vessel. Th SS Water Witch was launched D cember 20, after consumption 1,700 less man-days for hull erecti than any similar vessel built pr viously.

President Robert Christie United Engineering Company w advised that one of the company fine war-built tugs played an impo tant part in the Normandy invasio

Skipper of this tug was **Lieutenan G. E. Perry, U.S.N.,** who is well r membered in San Francisco marit circles, having been assigned various shipyards doing Navy wo before he went over seas.

Now seeing service on more than 600 ships

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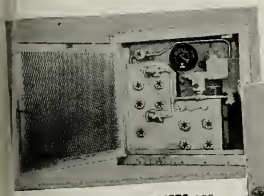
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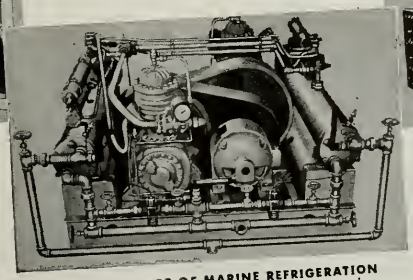
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For full details, write for the Marine Booklet. *General Electric Company, Air Conditioning and Commercial Refrigeration Divisions, Section 5592 Bloomfield, New Jersey.*

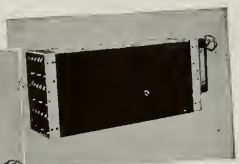
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SHORESIDE PERSONALITIES



Left: J. C. Ainsworth now connected with C. C. Moore & Co., engineers; and Charles C. Bray, back on the staff of De Laval.

Right: John Cordes of Cordes Brothers, California supply firm, is back on deck after a few months in sickbay. His many friends will be glad to see him looking so shipshape.



J. C. Ainsworth, Jr., With Engineering Firm

J. C. Ainsworth, Jr., has recently joined the staff of C. C. Moore & Co., engineers, Pacific Coast representatives of the Babcock and Wilcox Co. He will be attached to Walter Hill's staff in the Marine Department.

Ainsworth acquired his early engineering education in the halls of the U. S. Coast Guard Academy, leaving that institution in 1935, to engage in cattle raising in New Mexico. Realizing the approach of war, he returned to engineering and shipbuilding early in 1941, and gained considerable experience while employed in the yards of the Bethlehem, Moore and Kaiser companies. He was with Engineers Associated before joining C. C. Moore & Co.

Bray Returns to De Laval

Charles C. Bray has been appointed assistant to the manager of the Worm Gear Division of the De Laval Steam Turbine Company. Prior to accepting this position, he served as a metallurgist for the Special Steel Department of the Philadelphia office of Joseph T. Ryerson & Sons. Mr. Bray is not a newcomer to the De Laval organization, having served for ten years as worm gear sales engineer in the De Laval Chicago office before leaving to join the Ryerson organization.

Worthington Changes

The board of directors of Worthington Pump and Machinery Corporation at its meeting in New York December 21, 1944, elected **Clarence E. Searle** president of the corporation, effective January 1, 1945, t succeed **Harry C. Beaver,** who wa elected vice chairman of the boar of directors, and chairman of mana gement committee.

Mr. Beaver has been president o the corporation since 1931, and M. Searle has been vice president i charge of sales since joining th Worthington organization in 193

Hobart C. Ramsey, vice presider in charge of operations, was electe executive vice president.

Edwin J. Schwanhausser, vice pres dent in charge of the corporation manufacturing and sales operation in Buffalo, was elected vice pres dent in charge of sales.

Leslie C. Ricketts, manager of th corporation's Harrison works, w elected a vice president.

Returns to Federal

Charles H. Johnson has been a vanced to the post of chief engine of U. S. Steel's Federal shipyar at Kearny and Port Newark, Ne Jersey, it was announced by Lyn H. Korndorff, president.

Mr. Johnson helped pioneer hig pressure high temperature steam pr pulsion for ships, which has prove a highly important factor to the U. Navy in the present war. He assum his new duties after twenty-o months as coordinator of enginee ing for the U. S. Maritime Comm sion in Washington, D. C., and a visor to Vice Admiral Howard Vickery, vice chairman of the cor mission. The principal assistant Mr. Johnson in his new post will **Abraham S. Thaeler,** who has bee acting chief engineer during Joh son's absence.

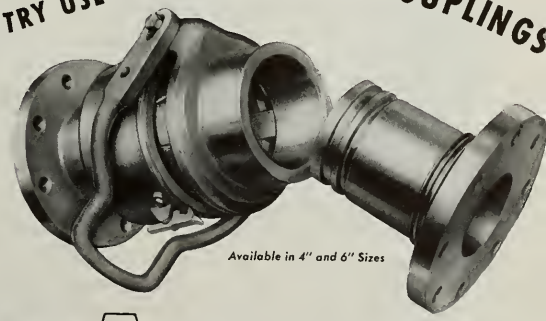


Worthington Pump Co. men, left and center: Hobart C. Ramsey and Clarence E. Searle; at right: Charles H. Johnson, now chief engineer of U. S. Steel's Federal shipyards at Kearny and Port Newark, New Jersey.

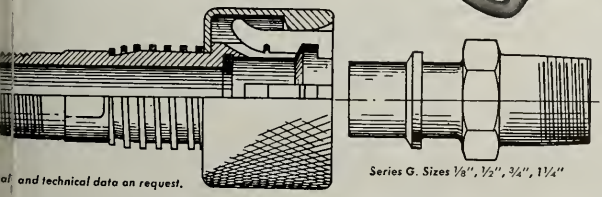


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In a recent ceremony befitting the occasion L. S. Sanford, regional director of the U. S. Maritime Commission, New Orleans, La., district, awarded the "M" pennant and Victory fleet flag to the A.B.C. Steel Equipment Co., Inc., at Mobile, Ala., on December 12. From left to right: Mr. Sanford, John Brownlie, president, and Rolph Gersteanzang, vice pres. of A.B.C.



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Stack temperatures are accurately and conveniently indicated by the Alnor Pyrometers installed on these Kaiser-built aircraft carriers. As in so many installations where reliable temperature indications are important, you will find Alnor Pyrometers in use with Diesel as well as steam marine equipment of practically all types. Write for Alnor Pyrometer bulletin with data on the complete line.

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Shoreside Personalities

The Coast Marine Engineeri Corp. of Long Beach has open offices at 116 New Montgome Street with **M. Palmieri** as lo manager. The concern is engaged ship design, conversion and repa Mr. Palmieri, a graduate naval arc tect, taught naval architecture at t University of Southern Californ He was also associated with the I Angeles Shipbuilding Corp. and t Consolidated Shipbuilding Corp., well as the Astoria Warrenton Sh yards, Inc.

The following well-known freig executives are handling the imp tant posts in the Pacific Coast C toms and Freight Brokers Assoc tion for 1945: **W. C. Auger,** v president of the San Francisco F eign Freight Forwarders, is preside **M. J. McCarthy,** secretary-treasur

Captain William P. Atkinson, m ter of the SS Mormacwren, of t Moore McCormack Lines, Inc., l been recommended by Vice Adm John W. Greenslade for the N Service Medal. The same award w be given to all officers and crew this vessel for the heroic work connection with the towing of USS Pasig more than a year a The Mormacwren got a line on Navy craft and for four days, un sisted in heavy seas and high win kept the Navy boat in tow u relieved by the cutter Navajo. incident occurred August 19 continued through August 23, 19

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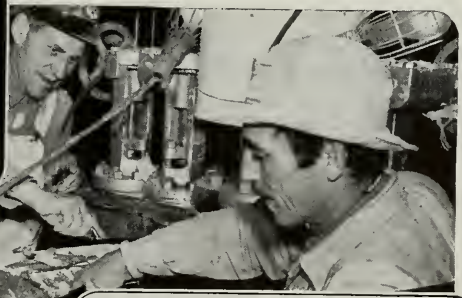
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Shipping Personalities

Carl W. Flesher, regional direc of the U. S. Maritime Commissi announced effective January 4, t **R. W. Owens** has been appoin regional industrial adviser, replac **C. W. Eliason,** who resigned. Flesher also announced that effect the same date **E. J. Clark** has b appointed acting chief of the contr terminations section.

R. Gwin Follis, vice president a director of the Standard Oil C pany of California, was recer named assistant to President **H. Collier.** Mr. Follis, one of the f most oil men in the country, is nephew of the late K. R. Kingsb long-time Standard Oil president.

M. A. Cremer, manager of Marine Exchange, has received vice that **Lieutenant Howard Whitmore,** for many years attac to the Hydrographic Offices in Merchants Exchange in San Fr cisco, is now in command of a C Guard supply ship.

His vessel is the FS-394 and i new craft built by the Ingalls Sh building Corp. yards in Alabam

William "Bill" Dotten, former bine engineer on the old SS Le than, has gone back to sea as c engineer after a long stay shores "Bill", who is 53, said that he intended to remain ashore, but acute shortage of men above below decks changed his mind.

The Puget Sound Division ele **A. J. Buckingham** vice president **Robert E. Landweer,** secretary-tr urer. The Columbia River Dist elected **Mark H. Beach,** vice p dent, and **R. D. Magill,** secret treasurer, and the Southern Cali nia Division elected **Horace** Elder vice president, and R. **Lazier,** secretary-treasurer.

The Portland Tug & Barge now functions as two organizat to meet requirements of the I state Commerce Commission. firm retained the original nam handle the floating equipment, w the Marine Contractors, Inc., incorporated to handle the const tion and contract work. There no change in ownership.

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• *Sketch by Jahn J. Floherty, courtesy "LOOK" magazine, illustrating Danforth in action on LCI*

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ir Reduction Appointments

C. D. W. Gibson, vice president in harge of sales of Air Reduction, as announced the following appointents effective January 1, 1945:

H. F. Henriques, formerly sales anager of the North Central Division, is appointed general sales anager.

J. J. Lincoln, formerly sales manger of the South Central Division, appointed director of sales services.

C. M. Bloodgood, who has been rving as sales manager of the Pafic Coast Division, is appointed astant to the vice president in charge sales.

All of the above new appointees ill have offices at 60 East 42nd reet, New York 17, New York.

H. P. Etter, heretofore manager of e Los Angeles District of Air Reuction, is appointed sales manager the Pacific Coast Division with eadquarters in the Mills Tower uilding, San Francisco, Calif.

nney Managing Director or Matson

William Roth, president of the atson Navigation Co., announced hat Warren B. Pinney, Los Angeles torney and hotel executive, has beme associated with the company as February 1, 1945. Pinney operated e El Mirador Hotel at Palm prings from 1929 to 1942 when it as purchased by the government. nce that date he has practiced law. His duties with Matson will inude the managing directorship of e Royal Hawaiian and Moana Hols in Honolulu when they are reored by the government. The comny's Southern California manager Ralph J. Chandler.

inner Honors John Allsop

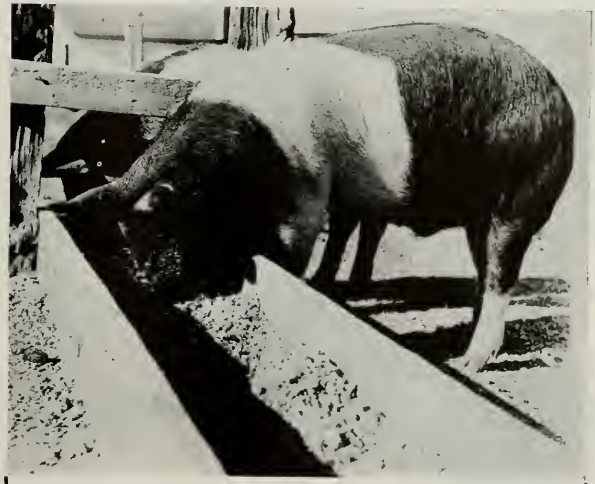
A special dinner was held recently the Rainier Club, Seattle, honorg John Allsop, who retired January as Pacific Coast manager of the oyal Mail Lines, Ltd., after 50 ars with the company.

The dinner was held under the onsorship of the Merchants' Exange with C. B. Warren, manager Alexander & Baldwin, Ltd., acting as master of ceremonies, and Villiam H. Hayden, widely known lmiralty lawyer, performing as astmaster.

Electronic Specialist Appointed

Elliott R. Vinson of Alameda, California, former electronics technician at the U. S. Naval Air Station, Alameda, has been appointed electronic tube specialist for the Pacific Coast district, Westinghouse Electric & Manufacturing Co., headquartered in San Francisco. Announcement of Mr. Vinson's appointment was made by Chas. A. Dostal, Westinghouse vice president.

A licensed radio amateur since 1925, and a member of the American Radio Relay League, Mr. Vinson owned and operated amateur radio stations W7RA and W6RRE prior to World War II. At Alameda, he won the commendation of the Navy's Bureau of Aeronautics as co-designer of an electronic maintenance device, and that of the Air Station for devising a new production control method for the repair and maintenance of communication equipment.



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Dean Swift (left), heads Western Geor Works office in New York City. Charles H. Doy, assistant production manager of Marinship Carporation.

Western Gear Works in New York

Dean Swift, formerly of Seattle, nnounces the opening of offices in the Chanin Building, 42nd and Lexington, New York. He will represent the Western Gear Works and the firm's associate plant, the Pacific Gear & Tool Works.

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HALF MODELS . . . For the men who lay out the ship's plating.

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The Western Gear plants are manufacturers of all types of gears and geared machinery. Their products include speed reducers, marine propulsion units, cranes and crane machinery, winches, hoists, deck machinery, capstan gearing, airplane gears and actuating units, ship lighting sets, various types of transmissions and oil field pumping equipment.

Appointed Assistant Production Manager

Charles H. Day was appointed as assistant production manager of Marinship Corporation, the tanker shipyard at Sausalito, California.

Day has already assumed special duties as head of the machinery, electrical, service and test completion department at the yard. His appointment was made on January 12 when the yard established a new record with the deliveries of ten Navy oilers and merchant tankers to the U. S. Maritime Commission.

Charles Day came to Marinship in March, 1944, as production engineer, and has assumed constantly increasing responsibility. His past record is extensive, including ship, dam and tunnel construction. Immediately prior to coming to Marinship, he was attending officer's candidate school for combat engineers of the U. S. Army. He was injured and received a medical discharge.

New Stock

The Allis Chalmers Manufacturing Company is now stocking in San Francisco equipment and materials made by the company in order to effect quick delivery to Pacific Coast customers. according to James L. McClure, Pacific regional sales promotion manager.

Equipment being stocked includes motor, transformers, Ampac welding electrodes, jaw type crushers, tex ropes, sheaves and pulleys and other general apparatus. Some of these shipments have recently arrived and are now available.



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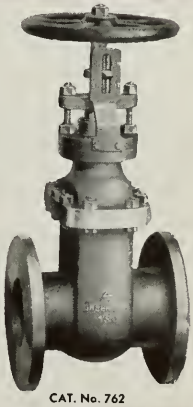
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Ingalls built the 60th 18,000 ton all-welded ship in its fleet for war without a single lost-time accident. The impressive safety record was celebrated at the christening of the SS Sea Hare at the Pascagoula, Miss., yard. In the launching party are, left to right: Dr. J. C. Crane, Mrs. Robert C. Matthews, Monro B. Lanier, Ingalls president; Mrs. Carl Teal, Mrs. Roy Wingfield, Mrs. Brevard Clayton, Jr., Mrs. Donald Brevard Clayton, wife of the president of Electric Constructors, Inc., of Birmingham, who sponsored the ship, and D. B. Clayton.

Coastwise Steam Elects Comyn

The Coastwise Steamship & Barg Co., Ltd., of Vancouver, B. C., ha recently been reorganized with new board of directors and W. Lesl Comyn as president.

The company's fleet is well know in British Columbia coastwise shi ping circles, and formerly include such vessels as the steamers Mog Anyox, Bornite and others, includin a large number of barges.

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Obituaries

Robert Howard Blake, 58, general manager in the United States for the Cunard White Star Line, died January 3, in New York. He was well known to Pacific Coast representatives of trans-Atlantic steamship lines.

Francis F. Allen, veteran shipping man and assistant traffic manager of the American-Hawaiian Steamship Co. since 1928, passed away in December after a prolonged illness. He is survived by his widow, two sons, Lieutenant Monroe Allen, U.S.N., and Ensign Francis Allen, Jr., U.S.N., and a daughter, Mrs. Samuel Stevens.

The passing of **Mrs. Kate Haviside,** wife of Harry T. Haviside, on January 13, was received with deep regret by the shipping fraternity.

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Lunkenheimer Executive Changes

Frank P. Rhame, a director, v president and assistant general m ager of The Luckenheimer C pany, valve manufacturers, has b made general manager, succeed **Charles A. Brown,** who retired cember 31. Mr. Rhame has been sociated with the company for e 25 years. **Homer E. Lunken,** a di tor, succeeds him as assistant gen manager.

Carra L. Lane, a production of wide experience in valves and lated products, has been named w manager, succeeding **George A. S ler,** who announced his retiremen vice president in charge of manu turing in September, effective cember 31.

Fred H. Hehemann, assistant c engineer, becomes chief engin succeeding **Jerome J. Aull,** who tired December 31 after nearly years of service with the firm. H mann has been with the comp since 1904.

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Hot Off the Press

(Continued from page 70)

Tube Turns, Louisville, Ky., announces its new maritime fittings catalog, No. 112, covering welding fitting dimensions specified in naval and maritime shipbuilding. It contains data on seamless wrought steel, wrought iron fittings and wrought carbon molybdenum alloy steel.

• • •

Whitman & Barnes, Detroit, Mich., have recently published a circular illustrating high speed spotting and centering drills.

• • •

"3-M Adhesives" is a new booklet published by Minnesota Mining & Mfg. Co., St. Paul, Minn. It contains comprehensive data on the types and uses of adhesives, their special characteristics and application.

• • •

"Structural Failures in Welded Ship Construction" is the title of a report recently released by the American Welding Society. This report is presented to assist the shipbuilding industry in its welding problems. Copies are available from the Society, 33 West 39th Street, New York 18, at 25 cents per copy.

• • •

"Suggestions from Fastening Head-quarters" is the descriptive title of new brochure from Shakeproof, In Chicago, Ill. This pamphlet sho hundreds of industrial applications Shakeproof products in aircraft, shi building and mobile, communiatio and electrical equipment. Free sar ple kits of lock washers, Sems fa ener units, cowl fasteners and thre cutting screws for both metals ar plastics, may be had on request fro bona fide potential users.

• • •

American Hoist & Derrick Co pany, St. Paul, Minn., has issued folder on American Uniwinch ele tric cargo winch, which gives co plete specifications and comprehe sive illustrations of all parts.

• • •

Caterpillar Tractor Co., Peoria, I announces Form D-41, a new 20-pa booklet illustrating its complete li of diesel engines, tractors, road m chinery on earthmoving, agricultu logging, mining, oil field and oth power jobs.

• • •

Catalog EN-95, describing instr ments for making precise conduct ity measurements in plants, laborat ies or classrooms, is available fr Leeds and Northrup Company, Phi delphia. This publication should of special interest to anyone w is considering new equipment a wants the latest specifications on struments, conductivity cells and cessories.

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MEMO

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Pacific Marine Review is publishing a Directory listing the executive personnel of the 200 Pacific Coast Shipyards — and all the Ship Operating Companies from Canada to San Diego. These are the people we want to reach. Better send for a copy - it's FREE. George —

Book Review

Pacific Ocean Handbook

This book is written by Dr. Eliot G. Mears, Professor of Geography and International Trade at Stanford University, and published by James Ladd Delkin, Stanford University, California. Price $1.00 paper bound, and cloth bound at $2.00. Now in its third edition, this book is an excellent source of reference and timely data.

The air age seems destined to affect the Pacific region making the area relatively smaller in point of time. The war's network of island radio stations, landing bases, and other installations is changing the face of Oceania—and the change is toward maturity. The Pacific's future is becoming discernible.

It is expected that foreign enterprise will become vastly interested in exploiting the virgin wealth of New Caledonia, New Guinea, Sumatra, Borneo, and various other rich areas. The turn to the Pacific in search of natural resources and new opportunities will bring these islands into the economic picture. This book is useful in that it gives an albatross'-eye-view of the topographical, geograpical, and social aspects of Pacific Oceania.

Herewith is smattering on the topics covered by Dr. Mears.

Ocean currents, volcanoes and earthquakes, from the Aleutians to Erebus in the Ross Sea, make informative reading. The Pacific region has intense volcanic activity. Even the seemingly dead volcanoes may erupt! Then we skim through the currents; notably the Japanese, Humboldt, California, and particularly, the coldest Pacific current, the "Ice Cellar," along with others; and find, according to Dr. Mears, that the effects of ocean current upon climate, fog, surface and air navigation, have never been adequately described or appreciated.

This handy information guide delves into the high pressures of the Horse Latitudes, the prevailing Westerlies and the Aleutian Lows wh incidentally, interested this re who wondered where all the Cal nia rain originated. Give all credit to the Aleutian Lows!

If you do not know how to finc "eye" of a storm, or do not k that Java is the most thundery re —holding its own over Mexico , —or that California to Sout Alaska is the least thundery rep then you should carry this little b around with you, just in case. course, we do not want to over the "Tehauntepecer," that nasty tic cyclonic wind that is experience the coast of Southern Mexico. wind is a menace to shipping, be us.

The Pacific is called a cold oc yet there is practically no ice in traffic lanes at any time and, strar enough, there is uniformity of perature from the Aleutians to L California; but what goes on b Lower California is for you to rea

Have we mentioned the exce (although too small in size) colle of maps, charts, graphs, and t clearly illustrating all subjects tre on the Pacific Oceania?

In the Precipitation (rain, s etc., to you) Chapter you'll find amazing things as "rain forests," deserts," and cyclonic precipita with light treatment on Kona st and monsoons. The monsoon Burma and elsewhere in Asia are ered more thoroughly in the Ap dix, along with valuable data for one caught on a life raft in th cific.

Other subjects covered—whic helpful to store in one's cranit include navigation and sea w

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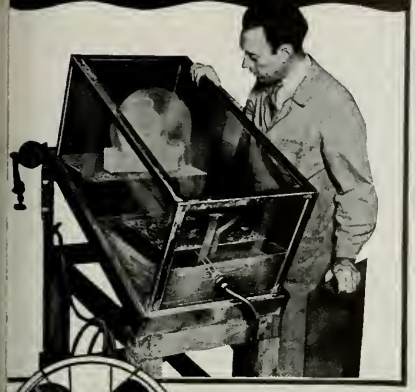
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Book Reviews

(Continued)

Hong On To Your Line

Through the kindness of Herman D. Nichols, vice president of Tubbs Cordage Company, San Francisco, we received a copy of **Hang On To Your Line,** an interesting 14-page booklet published by the Navy Department, Bureau of Ships, further described as Technical Publication No. 5.

This booklet which is amusingly illustrated, briskly explains the different types of lines and their uses; it also contains complete tables showing the minimum specified strength in pounds, coil length and coil weight and sizes of wire ropes to replace manila lines. The book covers the care of lines, a list of 15 "Don'ts", as well as a summary of the danger signals which warn that it is time to discard a line.

• • •

Port Terminal Operation, by Lt. Col. Eugene H. Lederer, published by The Cornell Maritime Press, New York City, is a 448-page book, price $5.00. It deals with the problems of pier management, stevedoring, stowage and lighterage, and is the only book that has brought together all phases of port terminal operation. The author has had more than 25 years of practical civilian and Army experience in land and water transportation, and the book includes efficient methods for reducing time and labor costs. It is applicable to peacetime or wartime uses and is equally valuable training as a manual or as a guide book for the experienced man.

Books Afloat in 1944

Why Sea Power Will Win the War, by Rear Admiral Yates Stirling, Jr. (Frederick Fell, Inc., $3.00). This is a powerful summing up of the strategic value of sea power, written by an officer who has given the subject study and thought. This is an illuminating and significant book for the intelligent layman.

• • •

Connecting Ships Wiring, by Gordon A. Nowlin (Houghton, Mifflin Co., $3.00). A well written and practical manual of special interest to the various branches of electrical work in which cutting-in men specialize.

• • •

Shipbuilding Cost & Production Methods, by W. B. Ferguson (C nell Maritime Press, $3.00). An ciency guide for the shipbuildin dustry covers the problems of control and production control ganization. It contains charts, gra and illustrations which should p very valuable to shipbuilders management in general.

• • •

Maintenance Arc Welding (James F. Lincoln Arc Welding F dation, Cleveland, Ohio, 50c) collection of 25 award papers c ing the application of arc weldi a number of different industries. book contains 234 pages of ch diagrams, photographs and co text of general benefit to industr

• • •

Marine Pipefitting, by Ver Hase and Ralph W. Allen (McG Hill Book Company, Inc., $3 This book covers detailed inform which the trainee or worker in rine pipefitting should have. It trates all the major piping systen ships and the latest methods o stalling them. Modern shop pra is also explained and mechanica mathematical piping layouts.

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Pacific MARINE REVIEW

MARCH 194



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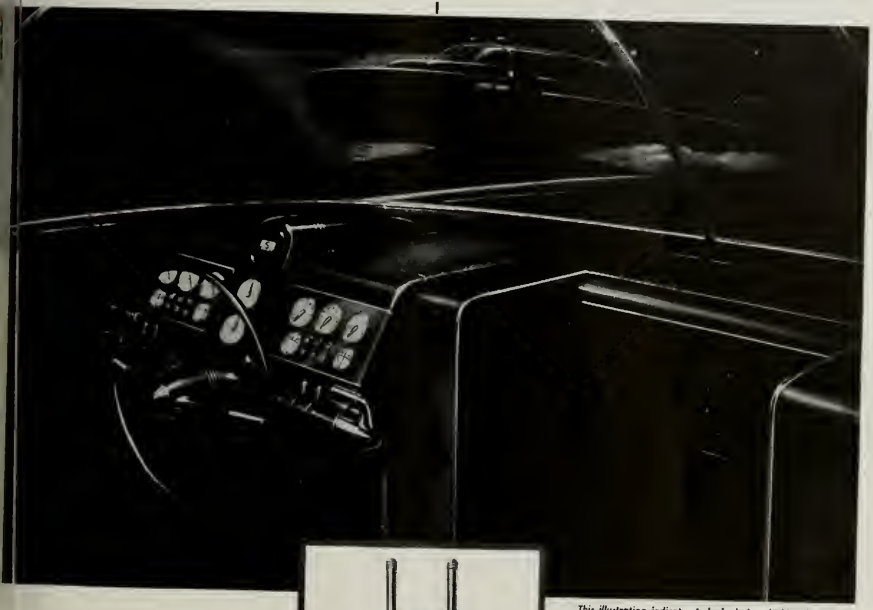
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This illustration indicates today's design thinking for postwar craft on which Bendix-Marine B-K Controls will function.



The models of B-K Remote Controls in current production for war jobs and certain other vessels are now being supplied to boat owners whose boats are eligible for priority.

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PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
Offices In: New YORK CITY . . . . . 16 West 46 Street, Telephone BRyant 9-8436
LOS ANGELES . . . . . 816 West 5th Street, 13. Telephone MIchigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.



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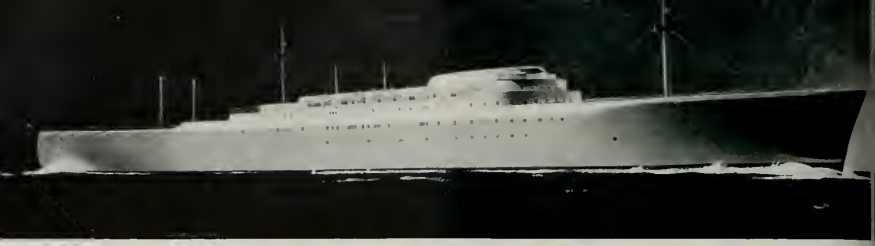
Pacific MARINE REVIEW

The Federal Department of State has formed a Shipping Division with Jesse E. Sangstad as chief and L. James Falck as assistant chief. Their declared function is the formulation and coordination of policy and action of the Department of State in matters concerning international shipping. This includes such activities as:

(a) Analysis and study of all international aspects of shipping and formulation of policy concerning the economic, commercial and political aspects.
(b) Review of developments in maritime services and laws of other countries and their implications to the foreign policy of the United States.
(c) Analysis of foreign policy aspects of subsidies to shipping and of discriminatory laws or practices against American shipping.
(d) Analysis of foreign policy aspects in relationships between private and Government shipping during the war to post-war transition period.
(e) Conduct of negotiations between foreign governments and the Maritime Commission and W.S.A. over disposal of tonnage, transfer of nationality, and such matters.
(f) Formulation of policy recommendations on the effect of ocean freight rates and marine insurance rates on foreign trade.
(g) Analysis of legislation affecting international shipping and conventions, treaties and agreements governing the shipping and shipbuilding industries.
(h) Analysis of and recommendations on policy of the Department of State on revision and adjustment of navigation laws.
(i) Interpretation and liaison relative to international conventions concerning seamen.
(j) Drafting of instructions to Foreign Service Establishments regarding reports on economic and political matters in the maritime service and shipbuilding industries of other countries.
(k) Analysis of these reports and furnishing information therefrom to department offices and other Government agencies.
(l) Analysis of regulatory measures and standards affecting shipping and trade to determine their relationship to foreign policy.

This statement is an abstract of the release describing the functions and activities of the New Shipping Division. Evidently the Department of State intends to probe deeply into the maritime industries. If this is done wisely and objectively great good may result to American shipping. On the other hand, it may simply add to the present confusion of overlapping regulatory agencies. We note that the State Department in its regular line of duty is at present arranging American participation in the proposed post-war international safety at sea conference. This conference will consider the impact of sea experience, and particularly war sea experience, on the findings of the 1929 London Convention for Safety of Life at Sea. Technical committees are now being formed by the Coast Guard to frame the groundwork for the position of the American delegation at this conference. The steering committee is headed by Admiral Waesche, and includes Rear Admiral J. F. Farley, Vice Admiral Howard L. Vickery, Jesse E. Sangstad, Almon E. Roth and H. Gerrish Smith.

In this connection it is to be hoped that one of these technical committees will be charged with the duty of investigating safety at sea for passengers of transoceanic airplanes. If the skyliners were as heavily laden with safety devices as are passenger liners, the bugaboo of post-war air competition would soon disappear.



Post-War Liner Interiors

By Jack Heaney
Chief of Interiors—
George G. Sharp, N. A.

PROSPECTIVE passengers must wait for the day when present plans become peacetime realities and ships are no longer dressed in Navy gray. In the meanwhile science and industry, socked by the impetus of a world at war, have spurted ahead to great and unpredicted achievements, and the field of naval architecture, combining its talents with these rapid developments, has accelerated its own progress to exceed all demands placed upon it by total war. But to the casual observer in the world of peace, the advances in ship design will be far less amazing than the radical changes expected in other forms of transportation.

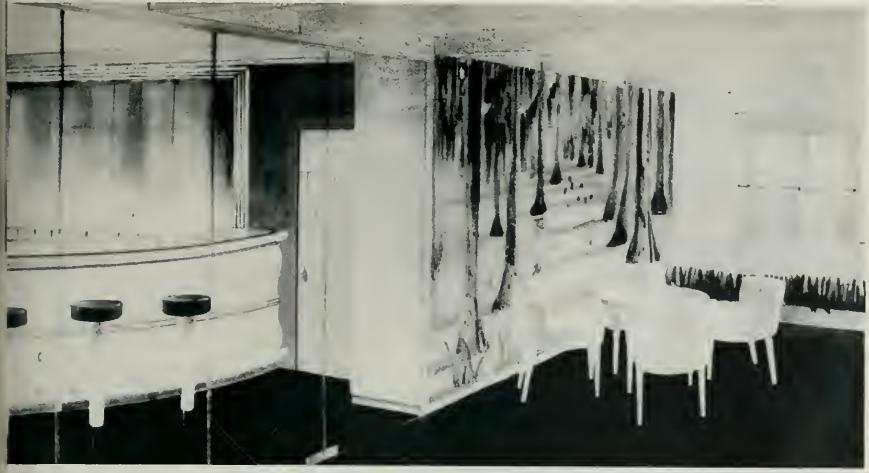
Today all ships are stripped of their peacetime interiors and converted to practical wartime service, a service which many will not survive. The field for new design is an open one; but ships built tomorrow will be conceived by men taught by experience to understand the scientific application of safety, the modern developments of comfort, and the architectural arrangements for convenience.

Since ship interiors are an integral part of a complete unit, they must be treated with knowledge and care avoiding extremes of decoration which quickly become dated. The interior decorator who tries to narrow his perspective down to what is artistically referred to as "decor" finds himself frustrated in his attempt to bring aboard his land-born techniques, because it is essential that he know the whole ship—and more

Illustrations are by the author, courtesy of George G. Sharp, N. A.



Corner of dining room.



Corner of club room and deck cafe.

-he must understand the importance
f its structure.

Cooperation Needed

Endless factors are involved in the
oduction of successful interiors:
ucture represented in the critical
acing of bulkheads and their mean-
g; fireproofing, including knowl-
ge of zones, and the ratios which
termine the percentage of com-
stibles which may be used in cer-
n areas. The designer must co-
erate with piping, electrical, and
ntilation departments to prevent
ds and ducts from puncturing
lkheads in the most obvious places.
: must be acquainted with sanitary
asures prescribed by the Board of
alth, such as rat and vermin-
oofing. He must consider ship
intenance: durability of materials,
n-corrosive metals, mildew-proof
rics, rust-preventing paints, and
n-skid deck coverings. And he
ist not forget that his work will be
bject to torque, hogging and sag-
gig.

Such knowledge is the solid foun-
dion from which all future plans
d designs must be evolved. On
: mental blueprint of experience
anges are continually being made
fresh ideas, new horizons, by sci-
ific advance, new materials and
oducts.

Post-war passengers on boarding
ship will rightfully expect some-
ng wholesome and new, not the
ll-worn atmosphere of period dec-
tion, nor will they wish to be as-
tonished by the efforts of the ultra-Bauhaus school. Good modern design is expressed not in cubist furniture and bald emptiness nor in surrealistic or impressionistic art, but in the live and graceful lines of Contemporary Classic, in the controlled and effective application of color and through emphasis on texture as an accent in design.

Passenger Appeal

Passenger appeal is of prime importance. Simplicity of interiors is a requisite for mental and physical comfort and is incidentally of great economic value in ship operation. Extensive detail and over-ornamentation is not only impractical to live with for any period of time, but will not stand up well under arduous conditions at sea. Thus materials such as the heavy wood paneling and decorative trim of the past—fire hazards in the extreme—should and will be replaced by fireproof insulation combined with fireproof veneers for nonstructural bulkheading. In general these bulkheads do not need to be disguised by wood veneers or other wall coverings, but make a frank and pleasing background when painted in inviting matt pastel shades. But for public rooms, such as a cocktail lounge, which require dress suits and individuality, simulated leather paneling will accent doors, bar fronts, and walls. Fine veneers of the many resin-impregnated rare woods applied over a fireproof core will provide the proper atmosphere for a library and conform to fire laws at the same time.

In public rooms wall spaces will be treated simply, relieved and softened by draperies and an occasional picture or mural painting. Ceiling heights and widths of rooms must be taken into consideration and the size and scale of murals and portraits determined accordingly. Although colors will be in keeping with the character of the room in which the mural is placed, brilliant and overpowering paintings, which must be lived with, often have a very wearing effect on a person's nervous system and should be used with restraint. In many cases warm, sepia-toned photographic murals are at once effective and economically practical. A broad landscape with spacious perspective of earth and sky will appreciably increase the apparent size of a small room and it may be easily changed or replaced if damaged or when variety is desired.

Space and Weight

The limits of space into which the naval architect must fit the numerous essentials that operate a ship as well as its cargo and passenger accommodations have always been a challenge. Extra decks cannot be added on, nor an additional wing built out to house another stateroom or service space. In the past the solution has been to squeeze everything possible into a small area. Ships of the future, whatever size they may be, will no longer have the conventional, cramped accommodations, because more square feet of living space will be allotted each individual. The crew's quarters will as large as



Example of wall treatment using photographic mural to widen a long entrance lobby.

were passengers' staterooms before the war, and as well equipped. Low sofas and chairs will emphasize the area and height of a room, and transparent glass tops on tables appear less bulky than those of opaque construction. Copper-backed, flesh-tinted mirrors will increase the depth of a room and at the same time maintain its warmth.

Of the real problems which beset the ship designer, perhaps weight and stability present the most difficulties. Lighter metals, such as magnesium and aluminum, newly developed materials like Fiberglas, may be used to lighten the superstructure and joiner bulkheading considerably. But what advantage is gained in the conservation of weight here if we install lavatories and toilets weighing at least 100 pounds each and bathtubs weighing as much as 500 pounds? One solution to this problem will be found in the use of low-pressure glass laminates for bathroom fixtures. They will possess the necessary strength and water-resistant qualities, and molded in a large and practical size they will save hundreds of pounds.

Plastics

In general, the use of plastics aboard ships is automatically restricted by their low melting point. Bathroom fixtures seem to be an excellent application of this material, since there is no reason for them to withstand the heat test that fireproofing regulations require. However, when it is evident that a good-looking plastic door knob would add the finishing touch to a door, it must be immediately considered that fire might break out within the room and if the door handle melted off, escape for anyone trapped inside would become impossible. So the beauty and functional value of plastics must on the whole be relegated to use in purely decorative features such as drawer pulls, bases for lighting fixtures, picture frames and other ornamentation. Practical and very handsome, however, are transparent methyl methacrylate chair arms. Strong and easily cleaned, they are pleasing to the touch and will not, like metal, become cold and uncomfortable in an air-conditioned room. Balustrades and railings on open stairways and around swimming pools will be made of clear plastic whose power to absorb and refract light will give fascinating luminous effects to frosted edges and rail endings. Materials coated with plastic will bring longer life and ease of maintenance to upholstery. Attractive wall coverings are being developed from fabrics impregnated with low-pressure resins. Contrary to the usual properties of plastics, the phenolic laminates are specifically non-combustible. Table, dresser and bartops made of this material are absolutely cigarette and alcohol-proof. Used exclusively throughout the ship, they may be obtained in any finish desired, including most of the rare imported woods.

Research and experience have already made it possible to build a completely fireproof ship. A committee appointed by the Senate and headed by George G. Sharp, Naval Architect, conducted fire tests aboard the S. S. Nantasket, noting the behavior of the ship's services, materials, and the action of the fire itself. As a result, rules for American ship construction, maintenance, and operations, have been drawn up to assure full fire protection and fire prevention. They affect every aspect of interior design, including deck coverings, bulkheading and furnishings.

Fireproofing

One of the most interesting and happy developments in fireproofing is the perfection of a wide variety of glass fiber materials. Fiberglas wool, made of minute glass filaments bonded together, was first used on ships before the war as insulation in refrigerated cargo spaces. Material of woven glass fibers has since been used for pipe lagging and as insulation for electric wiring. During the war its uses have been further expanded; new forms have been developed. One type of this lightweight material is used in stateroom bulkheading and will be a very important factor from the angles of weight and stability as well as fireproofing. For decorative purposes, fabrics have been perfected which are entirely fireproof and are used today, often in combination with asbestos, for theater curtains. The lighter, more flexible Fiberglas fabrics will make graceful, attractive and safe draperies for interiors of postwar ships.

Decks and bulkheads, according to fire laws, must maintain their structural integrity for one hour under a temperature of 1500 degrees Fahrenheit so that any fire which breaks out may be isolated and brought under control without endangering other parts of the ship. In all-steel ships of today, this control is comparatively easily accomplished. The character of deck and wall coverings, however, influences the safety of escape, and, if inflammable material is used combustion may occur without direct contact with flames due to the intense heat through a deck or bulkhead.

Impregnated Woods

In interesting new development which is now merely in its experimental stage is the use of impregnated woods as a deck covering. This would satisfy the multiple require-

nts of a surface light in weight, n-combustible and attractive. It is ainable in a wide variety of grains, l due to its specific properties uld prove extremely durable and y practical from a maintenance le. It is now undergoing the sever- tests possible. Applied directly r steel on the weather deck it re- ces heavy wood, two and one-half hes thick. For enclosed desks, it uld be laid either directly on the el or over the magnesite covering are top coverings most generally d today, such as linoleum, rubber, yl, asphalt tile, and cork com- nds. Furniture, an obviously es- tial part of interior decoration, is exempt from fire regulations. In ny cases metal replaces the wood me of a chair, and beds are usually nstructed of steel. Through care- damage control and purposeful ction of materials, American pas- ger ships in the years ahead will the oceans absolutely free from r of catastrophe by fire.



Single passenger stateroom.

Lighting

Proper lighting is recognized as of the most important influences the equanimity and comfort of ople who live, work and take their reation indoors. It is also an in- tely critical factor in the produc- n of a successful interior. Dra- tic or subtle effects may be ob- ned entirely through careful and ll-directed lighting which will em- asize or subdue a certain part of room.

The wide variety of tastes in light- have, in the past year, prompted ncentrated chemical and electronic earch, which has as its objective nt pleasing to everyone. A recent nonstration proved that the color well as the amount of light may individually controlled by simply ning a dial. Public rooms will ke use of concealed or indirect nting for decorative effects, to il- minate murals or carved glass nels. Passageways and stairways l be carefully treated for excellent ibility with no irritating glare from e overhead fixtures. A plastic ma- ial has been developed which will as a screen for ceiling lights. It produced in the form of a thin, nsparent sheet, lined with opaque colored louvres which control the ection of lights placed behind it, venting the beam from shining in eyes of anyone approaching and y permitting the rays to pass ough vertically.

Interesting effects have been ob- tained in dining rooms on lower decks where windows cannot be installed. Large rectangular panes of glass built into the shell lining, correctly illuminated from behind, will give the impression of real windows. Against a background of restraint and quiet luxury, lighting fixtures designed in careful detail will add bright accents of character and harmonious color, emphasizing the charm of each room. An open-air swimming pool with iridescent lights glowing beneath the surface of the water will become the center of attraction at night time.

Air Conditioning

Public rooms in some ships were air-conditioned before the war, but staterooms depended on the standard wall bracket circulating fans. In ships built after the war, air-conditioning will be carried to every room. Temperatures and relative humidity will be automatically controlled. A passenger's apprehension of a sticky, uncomfortable voyage through tropical waters will be only a memory. Furnishings will take their place alongside ventilation in the importance of providing for passengers' psychological as well as physical comfort. Soft, cool colors, light materials in fabrics, and plenty of window space will have an important influence in the development of interiors. Deck cafes, wide promenades, swimming pools, and spacious recreation decks for outdoor games and sun bathing will be the most popular areas for relaxation.

Streamlined Conveniences

Passengers on the ships of tomorrow will greatly appreciate the innovations in smoothness and speed being developed on the 1945 drafting board. Peacetime production will provide vessels with all the conveniences and entertainment facilities of home. As an indoor pastime, the passenger may prefer a heated game of bridge, or a good book in a quiet corner of the library; thinking of home or business and worrying a little, it will be as easy as dialing a number to turn to the ship-to-shore telephone or radio and dictate a letter to a secretary in the office or check up on the health of the family ashore. Then, with mind at rest, he can go to the theater for the latest movie or watch Hildegarde perform in New York over a precision television set. In a tasteful atmosphere of charm and comfort one may pursue whatever diversion the mood dictates; dance, or chat over cocktails, or just relax in absolute surety that nothing can upset the enjoyment of a voyage at sea. Not fire, nor icebergs, nor collision, can affect the equilibrium of life aboard a ship protected by scientific construction and operation, and guided by radar. Her efficient performance, coupled with the beauty of her modern interior and exterior design, will make her the most pleasurable method of travel yet conceived.



One of America's mightiest and newest battleships, the 880-foot, 45,000 tons displacement Missouri. She was commissioned on October 27, 1944, and has a battery of nine 16-inch guns.

(Official U. S. Navy photo)



An unusual shot of a battleship, USS Iowa class.

West Coast's Warship

Ninety-Eight Combat Vessels Commissioned in the Fin Eleven Months of 1944, in Addition to Hundreds Of Auxiliary Craft

By T. Orchard Lisle

Eastern Editor, Pacific Marine Review

WHILE PRIVATE and Navy shipyards of the Pacific Coast may not have done much in the way of building the largest types of fighting craft, they have made a very excellent showing with the smaller classes of naval vessels such as light cruisers, submarine tenders, destroyer tenders, hospital evacuation ships, destroyers, destroyer-escorts, submarines and LST's, not to forget troop transports and com attack transports.

These ships are just as essentia naval action as is the mightiest b tleship. Before going into details vessels completed for the Navy the West Coast during last year the previous years of the war, ho ever, the record will be clearer the national output of combatant auxiliary craft is outlined.

Today Uncle Sam dominates seas. Although the U. S. Navy lost 115 fighting ships, ranging fr one battleship down to 35 sub rines, in three years of war, the

o 1944 saw 1167 U. S. combatant vessels aggregating 3,893,000 tons displacement in active service. This is easily the mightiest fighting fleet in the world's history. Auxiliary craft swelled the U. S. Navy fleet to 61,000 ships with 11,707,000 tons total displacement. Of these 54,000 were diesel-engined landing craft.

Considering that this huge fleet was built simultaneously with a merchant marine of record size, it stands as a remarkable achievement of the American shipbuilders and the American people, including artists, parsons, bricklayers, butchers, wrestlers, doctors, newspapermen, authors and others from every walk of life who have taken up the shipbuilding arts during the emergency. For the planning and direction of the naval building program credit is due to the Navy Department's Bureau of Ships, headed by Vice Admiral Edward L. Cochrane. In addition, the Bureau of Yards and Docks under Rear Admiral Ben Moreel has planned and directed the construction of over 150 floating docks (many on the Pacific Coast) and of about 35 large graving docks. Under this Bureau have been completed domestic dock and base installations to a cost of $5,200,000,000 and overseas marine bases at a cost of more than $1,775,000,000.

To create, maintain and repair America's imposing fleet of fighting and auxiliary ships, no less than $26,657,000,000 has been spent to date. The output for 1944 was 39,971 new naval ships aggregating 5,457,490 tons displacement, of which 420 were combatant vessels. This compares with 24,179 ships totaling 3,556,903 tons in 1943, of which 568 were fighting craft.

Although we were not at war until December 7, 1941, the Navy completed and commissioned that year 33 combatant ships, including two battleships and one big aircraft carrier.

In taking stock of this huge building program, it should be borne in mind that a large number of the Navy auxiliary vessels are also included in the new tonnage figures reported during the past two years by the U. S. Maritime Commission. Hence, if the Navy's totals and the Commission's aggregates are added together we have an inaccurate and misleading figure.

The basic cause of this "error" is that many hulls have been laid down by the Maritime Commission as merchant ships, but have been finished for naval purposes. Both the Navy and the Commission list them as part of their annual output, resulting in overlapping or duplication. This includes baby flat-tops, attack combat transports and troop transports. Also, quite a few LST's have been constructed in Maritime Commission yards under M.C. supervision, and turned over to the Navy when completed.

During the first eleven months of

Part in Construction

Cruiser USS Oakland, built at the San Francisco plant of the Shipbuilding Division of Bethlehem Steel Co., Inc.
(Official U. S. Navy photo)





Last year the Navy spent $97,764,000 on rockets. They give the firing power of a battleship to a small vessel, and are proving of tremendous importance in the South Pacific. Here are rockets being fired from a West-Coast-built LST.

(Official U. S. Navy photo)

1944 the following Pacific-Coast-built combat ships were built by the Navy:

Light cruisers	1
Destroyers	32
Destroyer escorts	24
Submarines	4
Baby aircraft carriers	37
Total	98

Some of these destroyer-escorts and most of the 37 baby carriers are listed by the Maritime Commission in its merchant ship output figures, as just explained.

Figures on the large volume of naval auxiliary vessels built on the West Coast during 1944 have not yet been made public, nor have the numerous craft built by the Army on the Pacific Coast. Many important and sizable vessels were constructed in both Navy and private yards, or in Government yards managed by private builders. Excluding the Army, the total for the entire nation was 39,550 auxiliaries, including 37,724 landing craft of all types. Among those completed in the West were several submarine tenders of the Sperry and Proteus classes, which are products of the Mare Island Navy Yard and Moore Dry Dock Company, respectively.

The Proteus and her sister ships are the highest powered diesel-electric vessels ever built in the United States, and there are about seven sister ships, all told. Each has a total of 15,650 bhp installed for main ar auxiliary power. They are outstan ing because nothing like these shi is to be found in the shipbuildi program of the Maritime Comm sion so far as the power plant concerned.

In each ship there are eight 1 cylinder, two-cycle General Moto Cleveland diesel engines of 1600-bl each at Navy "sights-lowered" ratin three 12-cylinder 750-bhp auxilia power Cleveland diesels; one si cylinder 500-bhp Cleveland auxilia diesel; and one 100-bhp emergen engine. The main engines are co nected to electric generators, whi supply current to eight 1440-s electric propelling motors, geared twin propeller shafts. The reducti gears are Farrel-Birmingham, and t motors and generators are Allis Ch mers in the case of the Proteus, a Westinghouse in the case of t Sperry. Some of the ships have I current for the main propulsion w AC for the auxiliaries, and oth have AC throughout. The latter pears to give the best overall e ciency, and is being used on t latest vessels of this class. All t diesel engines are capable of g ing considerably more power th the figures quoted, so the maxim sustained output probably is in neighborhood of 19,000-bhp, though this power cannot be tra mitted to the propellers because the high auxiliary power needed all times.

In view of the present trend higher powers for merchant sh it is worth while noticing that fuel consumption of the Proteus sisters is somewhere around 3½ t an hour when running at full l load and with all auxiliary units r ning. A merchant ship other tha passenger liner would, of cou need less auxiliary power.

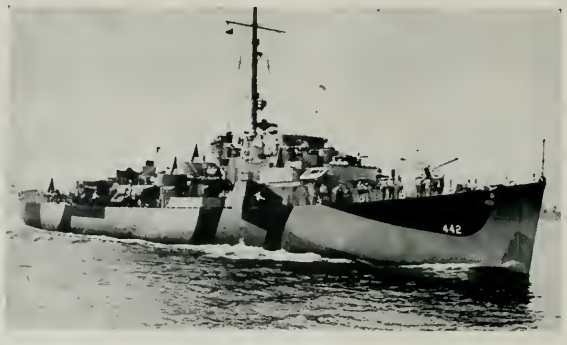
Figures for the output of all ty of naval vessels on the Pacific C during 1943 are available, and w first made public by the writer this article in the spring of 1

ON THE FACING PAGE:
Three U. S. Navy submarine tenders.









Newest type of destroyer escort being completed at U. S. Steel's Federal shipyard at Port Newark.

Altogether there were 2973 ships, including conversions. These are:

	Ships	Conversions
Cruisers	2	
Escort carriers	47	(28)
Destroyers	41	
Destroyer escorts	39	
Submarines	5	
Cargo ships, tenders, transports, salvage, vessels, tankers, tugs, store ships, rescue craft and others	154	(82)
Large minesweepers	27	
Motor minesweepers	115	
Submarine chasers	79	
Motor torpedo boats	12	
Miscellaneous	13	(13)
Harbor tugs	23	(9)
Net tenders	3	
Landing vessels of half a dozen types	2413	
Total	2973	

Of the foregoing, 132 were conversions and the remainder were new craft.

While it is not possible at this time to give a complete breakdown of the 1944 Pacific Coast output, it is possible to break down the combat ships commissioned into three of the four West Coast naval districts, as follows:

Ship Type	11th District	12th District	13th District
Light Cruiser	0	1	0
Destroyer	7	3	22
Destroyer-escort	9	15	0
Submarine	0	3	0
Baby aircraft carrier	0	0	37

Following is a breakdown of the 420 fighting ships commissioned from U. S. shipyards in 1944:

Battleships	2
Large aircraft carriers	8
Small carriers	37
Heavy cruisers	2
Large cruisers	2
Light cruisers	11
Destroyers	84
Destroyer-escorts	197
Submarines	77
Total	420

Repairs are a tremendous problem and the Navy and the Maritime Commission are converting some of the principal Western shipyards into repair plants and encouraging greater expansion of existing repair facilities. Many large floating drydocks built by the Bureau of Yards and Docks, U. S. Navy, are being allocated to Pacific Coast ship repair firms who can use them. The Navy is spending millions at its own repair bases for graving docks and shops. Notable among these bases are Hunters Point (San Francisco), and Terminal Island (Los Angeles Harbor). The demand for man power at these plants is growing and is becoming acute.

The war shipping picture on the Pacific Ocean indicates feverish activity in shipyards and ship repair plants for several years ahead.



Attack Combat Transport, USS Electra, ex Meteor, a C-2 diesel-driven motorship. *(Official U. S. Navy photo)*



United States BATTLE CRAFT

•

ine of battle ships are till the pride of the lavy. These mighty le- iathans carry tremen- dous firing power, plenty f fuel for great range t cruising speed, surplus ower for great speed, nd all the modern de- ices for gun control and ccurate spotting of en- my targets.

•

Pictures in this section pproved for publication y U. S. Navy Depart- ent, Washington, D. C. ll photos are Official U. S. avy photos.)

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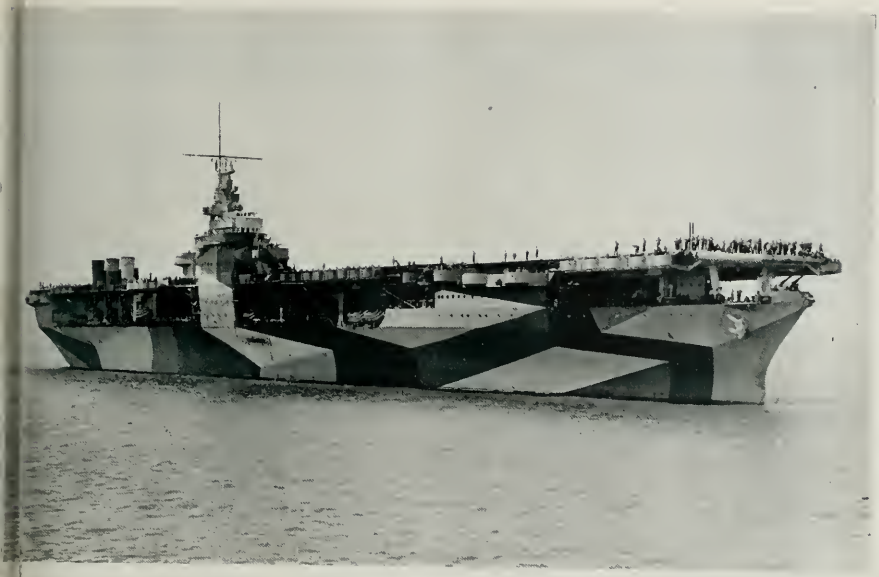






Three U. S. N. bat
ships of the latest
000-ton-displacem
type—the most pow
ful fighting un
afloat.





A U. S. N. aircraft carrier (CV-4 type). These craft, with battleships, cruisers, destroyers and subs, make up the mighty "task force" fleets that are sweeping the Japanese navy and merchant marine off the Pacific.

A U. S. N. battleship





Quarfering bow view of a "Wind" class ice breaker.

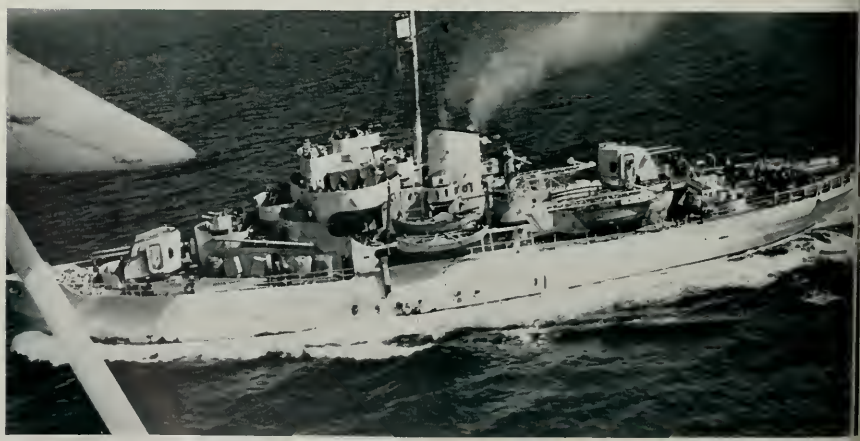
Diesel-Electric Ice Breakers

ONE OF THE m
unusual types of vessel produced d
ing the present war is the "Win
type ice breaker, developed by t
U. S. Coast Guard technical staff
collaboration with the engineers
Westinghouse and of Fairban
Morse, and built at the San Ped
Calif., yards of the Western Pi
and Steel Co.

Among the "Firsts" in Americ
marine practice claimed for this ty
vessel are:

First crow's nest fitted with remo
electrical control for practically

Aerial view of the Great Lakes ice breaker Mackinaw.



he functions of the vessel's power lant. First completely automatic leering by variable voltage control pparatus.

First hydraulic system for rocking hull to prevent sticking in ice.

First large application of bow pro-eller for breaking ice by turbulence.

The four seagoing ice breakers are amed Southwind, Eastwind, West-ind and Northwind. A similar ves-l intended for ice breaking on the reat Lakes and built by the To-do Shipbuilding Company, Toledo, hio, is named Mackinaw.

The seagoing type has the follow-g general characteristics:

Length—269′ 0″
Beam—64′ 0″
Draft loaded—28′ 0″
Displacement loaded—6660 tons.
Total shp (3 screws)—13,300

The hulls are practically double ielled and are of unusually all weld-l heavy steel scantlings and plating. he bottom is rounded and the bow id stern sections are so shaped as to revent pinching in heavy ice. The ern is notched in a shallow V rmed to fit the prow of a sister hull facilitate team-work between a ir of ice breakers.

There are twin screws aft and one rew forward. This forward screw used to churn ice by the turbulence creates in the water. It is usually ed in reverse. The superstructures these hulls and the unusual pro-sion of armament creates an appear-ce similar to a small battleship. Bow opellers were first proposed for ice eakers by a Great Lakes naval ar-itect named Kirby. The idea was cked up and used widely by Euro-an designers of these craft, but up the advent of these "Wind" class breakers it had been little used in merica. Practically all machinery installed on one deck that runs the tire length of the ship. Propulsion ower is arranged in three separate atertight compartments, each of hich contains two 1375-kw 810-m, 900-volt direct current West-ghouse generators, each generator iven by a direct connected six-cyl-der Fairbanks-Morse diesel engine the new opposed piston type. Com-ete flooding of one engine room ould result in the loss of only one-ird of the propulsion power.

Power Plant

Power for ship lighting and serv-e is provided by four 220-kw, 450-lt, 900-rpm, 80-per-cent p.f., 3-phase, 60-cycle A.C. Westinghouse generators each driven by a 300-hp Fairbanks-Morse diesel. Each of these generating sets incorporates a 4.2-kw, 120-volt, shunt wound d.c. exciter. Two of these generators with their control and distribution switchboards are located in the forward engine room and two in the after engine room.



Stern view, featuring pushing notch.

The motors directly connected to the two aft propeller shafts are each rated 5000 shp, 105/145 rpm, 900 volts, and are each installed in separate watertight compartments. The motor driving the bow propeller is rated 3300 shp, 140/210 rpm, 900 volts, and is also installed in its separate watertight compartment.

An interesting item in connection with these propulsion motors is the clever method of recirculating the cooling air. Each motor room is divided into a forward and an aft compartment by a bulkhead which is bolted to a flange surrounding the after edge of the motor frame. The motor ventilating fan is mounted in this dividing bulkhead and takes air from the forward compartment, discharging it into the after compartment under pressure. Since the after end of the motor is open, this air is forced through the motor, picking up heat from the motor coils. The heated air then goes through a salt water cooled heat exchanger and is discharged into the forward compartment to repeat the cycle.

Each propulsion motor is controlled independently from a motor control board located in each motor room or from one of three control stations located in the pilot house and one on each wing of the bridge.

Propulsion Motor Speed

Speed of the propulsion motors is controlled by connecting one, two or three propulsion generators in parallel to a motor armature, and gradually raising the generator excitation to approximately 75 per cent of maximum excitation, while the engines are running at a minimum speed and the motors are excited at a minimum



One of the six 2000-hp Fairbanks - Morse Westinghouse generating sets.

value. Higher speeds are obtained by raising the engine speed gradually from minimum to maximum speed, while at the same time the generator excitation is increased from 75 per cent to normal value. During this period the motor field is under the control of an automatic current regulator, which will cause the motors to absorb approximately the maximum available engine output at any speed and loading condition.

Four 300-hp, 200-kw Fairbanks-Morse diesel Westinghouse generator sets provide power for auxiliary purposes.



The speed of the engines is controlled from the motor room or pilot house speed controllers by means of a Westinghouse Air Brake Company pneumatic control equipment. Compressed air is obtained from air compressors in each of the three motor rooms. After passing through a reducing valve, the low pressure air is piped through small copper tubing to master speed control transmitters on the speed controllers. The transmitters actually are pressure regulators which are connected to engine governor actuators through magnetically operated shut-off valves. By means of the pressure regulators, the pressure of the air supplied to the actuators can be regulated between zero and 60 pounds per square inch. The actual pressure is determined by the position of the regulator operating levers, which are positioned by means of cams on the speed controller shafts. Several actuators may be controlled by means of one pressure regulator, and the speed of the corresponding engines will be regulated simultaneously to the same value.

Rotary transfer valves are provided to assign control to the motor room or pilot house master transmitter. Magnetic transfer valves are mounted on each of the forward engines. The function of the valves is to connect the actuators to the stern control, when the engines furnish power to the stern propellers, or to the bow control devices, when the engines furnish power to the bow propeller.

The power required to drive a propeller varies approximately with the third power of the rpm for a free running vessel. However, the power requirements will increase sharply if the speed is retarded by ice breaking or towing. Assuming that the propeller rpm remains constant, the power requirements during ice breaking will show an increase of up to 10 per cent or more of the power required for free running.

The approximate power requirements of the stern motors as a function of motor rpm are shown in the diagram herewith. The power required for a free running vessel represented by Curve A, while the power required during maximum ice breaking conditions is represented by Curve B. The assumption has been made that both motors operate at the same speed. It will be seen

lat when running at 105 rpm, the otor output will be 5000 hp for aximum ice breaking conditions, hile the output will be less than 000 hp for a free running vessel. o utilize the available power of the ngines, it is necessary to speed up ie motors by reducing the shunt ld current. The field current is ntrolled automatically by means of current regulator in such a manner at the motors will always absorb ractically the full engine output.

It is believed that this successful plication of a number of large di-ct-current propulsion generators, nnected in parallel, supplying wer to a single motor, will result a definite trend toward this type installation, especially on vessels quiring considerable power where ll horsepower is necessary over a ide range of propeller speeds, in ference to the series connection low voltage, high current genera-rs which has been used in the past.

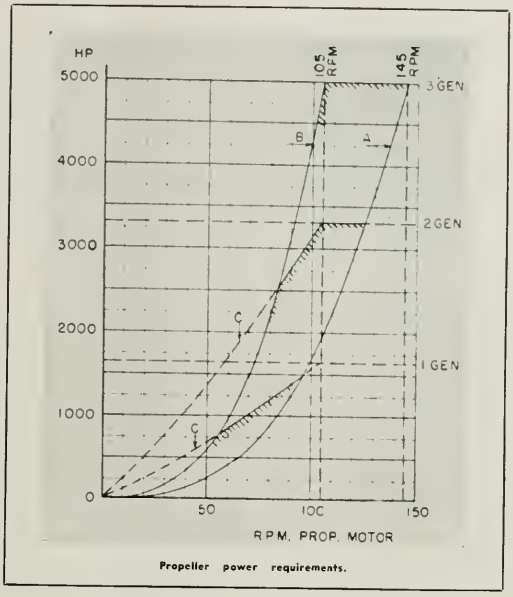
Propulsion Engines.

The Fairbanks-Morse engine on the ain propulsion units is of the new posed piston two-cycle type that s been in development for over a cade. It was ready for distribution st prior to Pearl Harbor, but is not ry well known because the U. S. avy has taken practically the entire tput for auxiliary craft.

This engine has two pistons in ch cylinder. The upper piston ives an upper crankshaft through ton pin and con-rod connection. ie lower piston drives a lower ankshaft through similar means. ain drive for two camshafts and ar drive for the scavenging air wer are taken off the upper crank-aft. Service pumps and the gov-nor are driven off the lower crank-aft. The two crankshafts are con-cted through bevel gearing by a o-piece vertical shaft fitted to-ther by a flexible coupling. Power ke-off is from the lower crank-aft. The frame of this engine is ilt up of steel plates welded, with table covered openings for ready cess to all parts. With covers on, is completely enclosed.

As the two pistons in each cylin-r approach their outer limit of vel, the lower piston uncovers a w of exhaust ports in the cylinder ll. Immediately thereafter the up-r cylinder opens a row of tangen-lly arranged scavenging air ports that the combustion gases are swept down and out and the space between the pistons filled with fresh air ready for the compression stroke.

This engine operates with very good fuel economy and great smoothness, being practically free of vibration over wide ranges of speed.



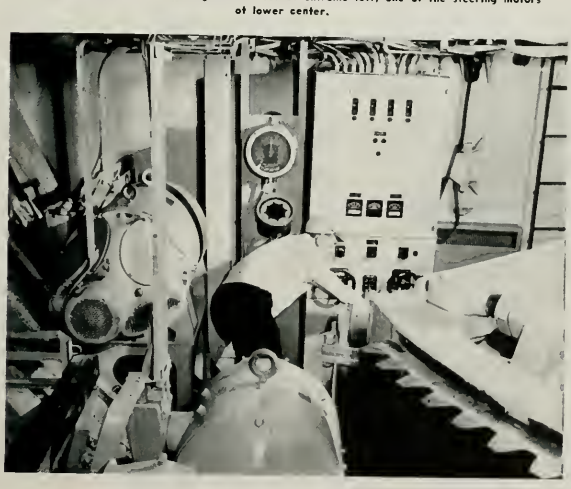
Propeller power requirements.

Forced Heeling

The principle of forced "heeling"

(Page 184, please)

Steering compartment—motor generator set at extreme left; one of the steering motors at lower center.



Efficiency And Production Control

OF TRAINING PERSONNEL FOR MANUAL ARC WELDING

By J. B. Arthur and M. H. MacKusick

TRAINING new personnel in arc welding is an important and a vital part of the production of all welded ships.

To us at Calship, training for welding work is a production job no different from that of any other production process. That is, we start out with raw material, process it, inspect and turn out the product.

This production process is necessarily large-scale in scope in order to handle the personnel requirements of the yard.

Naturally in any large-scale production process, the system of processing the raw material is governed by the following factors (all related to the economics of time, finances, etc.):

(1) Quality of raw material as received.

(2) Use of the processed product.
  (a) Consumption
  (b) Inspection standards

(3) Time or processing.

(4) Equipment, materials, personnel, etc., used to convert raw material to end product.

In such large-scale production it is necessary to decide upon the method of process, with all details worked out, in order to obtain maximum production capacity. In the training of welders the method of processing is dependent upon the following factors:

(1) Minimum production requirements for student welders after leaving "formal" training.

(2) Money allocated to "formal" training of operators.

(3) Operator qualification requirements.

The ideal method of processing is that one which would, in minimum time, turn out as a product mechanics who would be able to do normal production work without further training. Practically this is never reached, since time and money force a compromise. The purpose of this paper is not to present the method of training or the qualifications of personnel so trained, but rather to present a system of efficiency and production control for the training process regardless of method or end point.

In order to know if a process is working efficiently, and in order to know the status of each unit in a production flow line, it is necessary to have a method of quantity and quality control as well as a method of determining quickly and with a minimum of effort the operating efficiency of personnel and equipment used in the work. All such controls are in turn used to improve quantity, quality and efficiency.

Presented below is the method of such controls, the use of the metho and the results obtained by its use.

A person learns to arc weld h translation of a visual action into manual action, i. e., by manual mar ipulation certain results are obtaine which can be seen. There are prob ably in all cases several manual mar ipulations which might be used t give identical visual results. There fore the time used in actual "burn ing" of electrodes and intelligent in struction is a possible source of mea urement of production quantity quality and efficiency.

We have devised a system of mea uring "arc time" by use of consume electrode count. This could hav been done by use of "arc time" me ters; however, by use of an electroc count we also licked the problem housekeeping, full consumption electrodes, full use of available mai hours in the rod distribution depar ment, and incidentally eliminated th added equipment expense (install tion and maintenance of "arc time meters).

Electrode distribution cans we made as shown in Fig. 1. These ca are all numbered and each student assigned a specific can. Cans are al colored according to a shift coc thus facilitating the work of ele trode distribution clerks in issuin electrodes to students.

Initially each student is issued 1 electrodes. Stubs are deposited in the can and the can is then return to the rod room at the end of t shift, or sooner if necessary. Stu are counted and the count is enter on the form shown in Fig. 2.

The arc time is calculated fr the following equation:

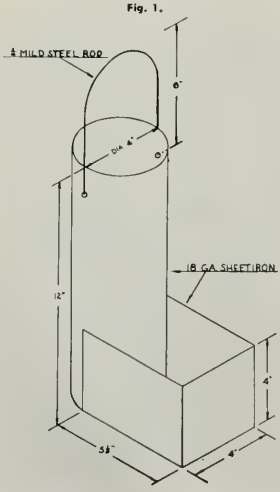
Arc time (minutes) = Number stubs × burn-off rate.

(Burn-off rate is expressed in m utes required to burn off 12" a 14" electrode.)

Extensive checks were made, a the figures shown below are avera

Mr. Arthur is Testing Engineer and Mr. MacKusick is Welding Engineer, California Shipbuilding Corp., Wilmington, Calif.

Fig. 1.



id accurate for machine settings
ed in training. These rates are for
WS, Class E6010 electrodes.

Size of Electrode	Minutes Required (2" Stub Loss)
1/8"	1 min. 9 sec. (i.e. BO = 10½" per min.)
5/32"	1 min. 20 sec. (i.e. BO = 9" per min.)
3/16"	1 min. 24 sec. (i.e. BO = 8½" per min.)

To illustrate: 50 3/16" stubs (2"
erage length) were returned.
Arc time (minutes):

$$= \frac{50 \times 84}{60} = 70 \text{ minutes}$$

This arc time is transferred to the
rd shown in Fig. 3.
This card is filled out further from
ne cards and test records. Calcu-
ions for efficiency are made as fol-
ws:

$$\% \text{ Efficiency} = \frac{\text{Arc time (min.)}}{\text{Training time (min.)}} \times 100$$

Thus, assuming a 9-hour shift and
ll training with 50 3/16" stubs re-
rned, the per cent efficient would
as follows:

$$\% \text{ Efficiency} = \frac{\frac{50 \times 84}{60}}{9 \times 60}$$

or 13% (approximately)

All cards are kept up daily by one
rk for all shifts and all students.
om this card monthly averages are
ablished to give the following fig-
s for comparison of instructors,
fts and students, and also to gage
provement or make changes in the
ining process:

(1) Average % Operating Effi-
ciency:
  (a) by instructors
  (b) by shift
  (c) overall
(2) Average arc hours required
to pass qualification tests.
(3) Training time vs arc hours vs
tests passed.

All students are compared daily
h the standards set up as above.
y variations from the standards
analyzed, and if below average
student is checked by the super-
endent and the instructor. The
lowing possible check chart of
iations and possible causes is then
d to determine what is happening:

) High operating efficiency, num-
ber of tests taken and failed,
average training time.
  (3) Repetition of an error in
  manipulation which has
  not been corrected.
  (4) Nervous student.
  (5) Incompetent student.
(2) Low operating efficiency, num-
ber of tests taken and failed.
Analysis:
  (1) Student is lazy or low in
  intelligence.
  (2) Physical handicap of stu-
  dent.
  (3) Lazy or incompetent in-
  structor.
(3) Average operating efficiency,
number of tests taken and failed.
Analysis:
  (1) Lazy or incompetent in-
  structor.
  (2) Nervous student.
  (3) Insufficient training for
  specific student who re-
  quires more than average
  attention and time.
(4) Low operating efficiency; other
results good.
Analysis:
  (1) Student should work
  harder. Has ability.
  (2) Instructor should keep
  student going uphill
  faster.
(5) High operating efficiency; all re-
sults good.
Analysis:
  More than satisfactory.

A complete analysis can thus be made to keep a close control on all students and instructors.

Results have been more than gratifying in the use of this system. During the first two months' operations, an overall improvement in the effectiveness and attainment of training objectives is estimated at about 30 per cent.

A research program is being pursued at the present time with a view to the determination of the following, using this control system:

(1) Fatigue factors in training.
(2) Overall training pattern plotting the course of absorption of learning by students against arc hours and training time.
(3) Ideal training time.
(4) Process of training according to sequence of presentation of units of training.

Such data will be published when results are obtained and correlated for a reasonable period of time.

We wish to extend our appreciation to the following for their untiring efforts and full cooperation in the use and application of this method of efficiency and production control of training personnel for manual arc welding:

Geo. H. Davies, Supt. Weld Training.
C. Hoffman, Asst. Supt. Weld Training.
C. Brandvold, Asst. Supt. Weld Training.
C. S. Kier, Supr. Electrode Distribution.

FIG. 2

ROD CAN #..... BADGE #..... NAME..... SHIFT.....

Date	Issued Rods	Returned Stubs	Arc Time	Date	Issued Rods	Returned Stubs	Arc Time

FIG. 3

NAME:.....
BADGE #..... STARTING DATE:.....
INSTRUCTOR:.....

Arc Hours				Training Time				Per Cent Efficiency				Tests & Results			
Date	Hrs.	Date	Hrs.	Date	Hrs.	Date	Hrs.	Date	%	Date	%	Date	Result	Date	Result



Famous transatlantic passenger liners repaired, serviced or converted to war roles at Todd, pictured above by Fred J. Hoertz, Todd staff artist, as a vast armada of ships to carry on America's part in the war.

Todd Sends 17,791 Ships To War

Todd Shipyards Corporation in 1944 surpassed all production records of the previous two wartime years and brought the number of ships its ten yards have built, repaired or converted to war purposes to 17,791,—a total of more than 92,000,000 tons.

The company's yards on the Atlantic, Gulf and Pacific Coasts delivered 413 fighting and cargo vessels during the year, bringing total construction since Pearl Harbor to 899 ships and exceeding the 1943 building total by 33 ships. The tonnage of 1944 construction was 5,207,000.

Ships repaired or converted by Todd workers in Brooklyn and Hoboken yards include virtually a complete list of peacetime luxury passenger liners, "leading ladies" of the Atlantic trade routes which the realities of war transformed into grim troopships and naval auxiliaries, stripped of the bright trappings of normal times and studded with armament and life rafts.

Into this list of famous ships handled by the company go such names as the Queen Mary, Queen Elizabeth, Normandie, Empress of Scotland, Ile de France, America, Manhattan, Washington, Nieuw Amsterdam, Aquitania, the diplomatic exchange ship Gripsholm, the Uruguay, Brazil, Samaria, Saturnia, Scythia, Monarch of Bermuda, and many others.

This 92,000,000 tons of shipping sent to sea from Todd yards represents more than five times the total merchant tonnage under the American flag at the beginning of the war, and equals about 90 per cent of all the then existing merchant tonnage in the entire world.

There were few missions of sea warfare in which ships handled by Todd yards did not participate. The list includes aircraft carriers, destroyers, combat troopships, naval auxiliaries, hospital ships, submarines, huge passenger liners converted to troop-carrying, tankers, dry cargo ships, numerous kinds of landing craft, and many other types, down to whalers and ferry-boats.

During the year, company yards repaired or converted 6645 ships, t taling 35,940,000 deadweight ton The number of ship conversions ar repair jobs in the United States w reported as approximately 23,000, that of this immense volume of r pair yard work, more than one-four was done by Todd plants.

16,892 Ships Repaired

The number of ships repaired converted in the company's yar from December 7, 1941, to Decemb 31, 1944, was 16,892. This vast a mada of ships of almost every d scription represents 87,197,000 ton The accelerated pace in repair wor as in building, was continued throu 1944. The five great company rep yards on the three coasts increas the monthly average of tonnage (vessels exceeding 1000 tons) handl by about 300,000 tons.

More Production—Less Man-hou

The increases in production 1944 were not the result of furth expansion of plants or personnel, b of the skills and efficiency of the ganization, which has behind it mo than half a century of experience ship repair and shipbuilding. How met the man power crisis is shown the fact that production was cons erably increased despite the fact th the company's personnel, at the e of the year, had decreased from 13 000 to 115,000 employees.

One of the most important of company's wartime undertakings v the operation for the Navy of the L Angeles Shipbuilding and Dry Do Corporation. The yard built N seaplane tenders and other na craft, and now is scheduled to eng exclusively in repair work. Tod first was appointed managing ag of the plant on December 9, 19 and last July took over operation the yard as an independent contra on a cost-plus-fixed-fee basis.

The complete 1944 record of sh built, repaired or converted in Todd yards—with the exception the Todd-operated Los Angeles y. whose production figures were available—is as follows:

Brooklyn division	8
Hoboken division	2 8
Seattle division	6
Todd Pacific Shipyards Inc. Seattle Division	7
Todd Pacific Shipyards Inc. Tacoma Division	1

(Page 184, please)



rore sight after
irs of comouflaged
l blacked-out ships
his highly illuminat-
white hospital ship,
.S. Mercy, recent-
completed at Todd
pyards Corp., San
ira.



.S. Jason, giant re-
ship, leaving
dd's San Pedro
ks. She is one of
17,000-ton vessels
he Ajax class built
he yard.



nching of U. S. S.
adio, second in the
es of destroyer
ders now building.



Army tug constructed by Ackerman Boat Company and equipped with ISOdraulic controls for steering.

Marine Hydraulic Controls

By William Lawrence Lewis

ISOdraulic control systems transmit motion from its origin to a distant point in a positive manner which is the principal requirement of any control method but seldom fully realized by conventional mechanical systems.

(Copyright 1945 by Adel Precision Products Corp.)

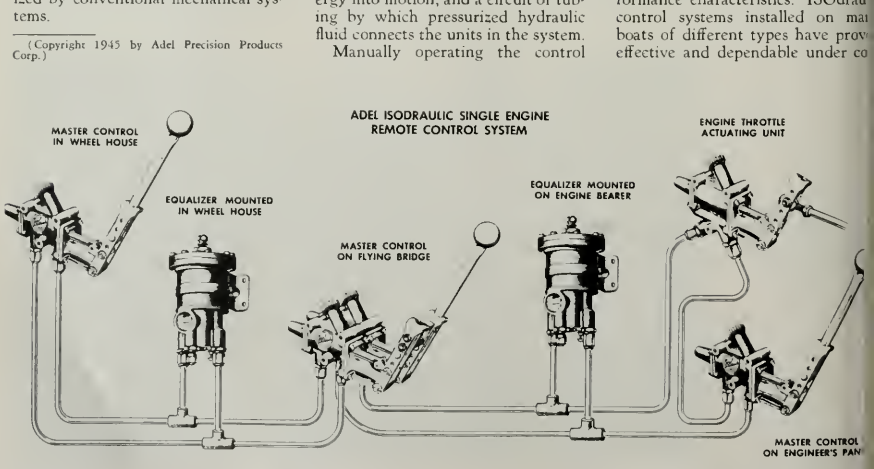
The essential units comprising the system are: a manually operated master control unit; a temperature equalizer or pressure compensator; a remote unit for translating pressure energy into motion, and a circuit of tubing by which pressurized hydraulic fluid connects the units in the system.

Manually operating the control handle in either direction cause simultaneous action on the part o the remote unit in perfect sychron zation with the master control uni

Moving the control handle applie pressure to the fluid by means of piston which is duplicated in the re mote actuating unit which likewis imparts motion to its lever for a tuating whatever mechanism or de vice is coupled to it. In effect, th fluid is a direct connection betwee the distant units. Either one may b made to function in unison with th other by adjusting synchronizin valves in the units. Temperatur fluctuations will have no effect o the adjustment, as will be explaine later.

Aircraft power plant control spec fications to which ISOdraulic con trols conform are extremely rigorou They require control systems to b fully dependable under all specifie conditions; be readily operated an set to any desired position whic must not be altered by either vibr tion or rapid and extreme changes i temperature. Remotely placed actu ating units must respond in exa synchronization when operated b the master control unit with no pe ceptible lag or lost motion. All par of a control system must be designe and manufactured in a manner assure long life and freedom fro mechanical defects.

Control systems engineered to me the above requirements are ideal suited to a wide variety of marine a plications demanding similar pe formance characteristics. ISOdrau control systems installed on mar boats of different types have prov effective and dependable under co



itions of extreme severity actually xperienced in regular service.

Some applications for ISOdraulic ntrols such as opening and closing ntilators which do not necessitate curate adjustment, or wherein only nall reversing forces are present, rmit the use of reversible type of SOdraulic remote actuating units. hese are essentially of the same conruction as that of the master conol unit but differ from the irreversle type containing built-in hydraulic cks, to be described later.

For other conditions subject to oderate reversing impulses, or to a nall degree of vibration, the system made irreversible by a small hyraulic resistor placed in the circuit. his simple device is used to block ıy tendency for the controls to be ibrated out of adjustment, providıg the reversing loads do not exceed predetermined value, for example, 5 inch pounds.

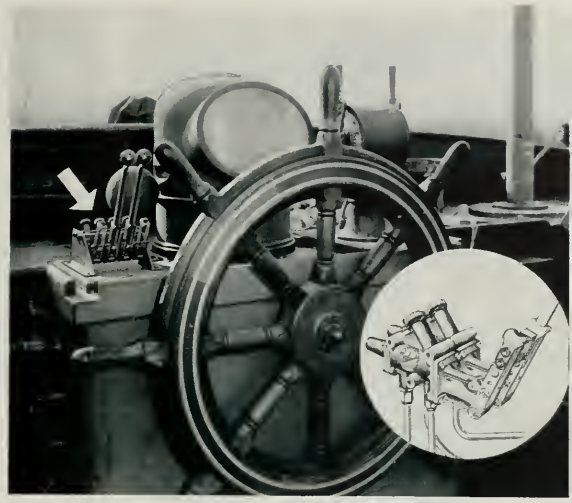
Where it is desirable to employ ontrols which are irreversible to illest extent (400 inch pounds), an ctuating unit having an integral hyraulic lock should be used.

Operating sensitivity is of paraount importance to close adjustent of control system. The operar must be able to feel the control ork, especially when limiting stops r detents are reached. If a noticeble amount of play or backlash is resent, it will be impossible to sense ıovement with any degree of cerinty.

An ISOdraulic system in which he units were separated by 50 feet, nder repeated tests showed an anular difference of only 3 degrees in ver travel measured when the maxnum applied load of 400 inch ounds was applied. This deflection the equivalent of .05 of the total ver travel at the opposite end. So nall a deflection relative to the magıtude of the load is regarded as beıg negligible.

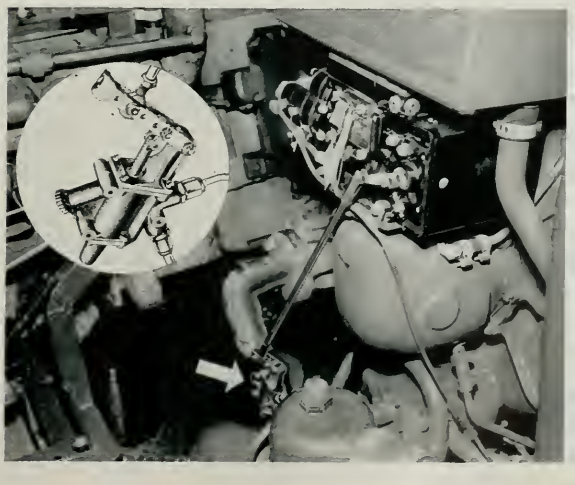
For engine throttle control and milar applications, the loads are ormally less than 100 inch pounds —usually in the neighborhood of 25 ıch pounds. In such cases, lever dection is imperceptible, enabling ıe operator to exert smooth, accuıte control over distantly located ıechanisms.

Marine applications demand the ıme rigorous performance qualificaons as do aircraft uses for which ıe ISOdraulic system was originally esigned. To adequately serve its urpose, it must perform satisfacrily under all conditions, and not fail to function when such failure may have disastrous results. Furthermore, it must be entirely reliable when subjected to extreme and rapid variations in temperature; and function satisfactorily within a temperature range of 65 degrees below zero to 160 degrees above, Fahrenheit. A 225-degree temperature range is possible in aircraft operations, whereas ship installations are not subjected to equally wide temperature varia-



ISOdraulic master controls on flying bridge for twin engine installation. (Air Force crash rescue boats.)

Remote ISOdraulic actuating unit for regulating engine throttle. (Air Force crash rescue boats.)







Above: Pneumatic steering system actuated by ISOdraulic remote control unit.

Left: Master control unit in ISOdraulic system mounted on steering pedestal. (Ackerman Boat Co. tug.)

tions within a short space of time. However, it is possible for shipboard control installations to be exposed to unusually extreme thermal conditions and wide variance in temperatures. For instance, to cite some actual installation conditions, it is entirely feasible to have ISOdraulic operating units located in an engine room; run the connecting tubes through a refrigeration compartment; parallel them in close proximity to steam pipes; and otherwise continually subject portions of the same system to varying extremes of temperature without in the least affecting its operation or adjustment.

Satisfactory performance under such extreme conditions is made possible by an ingeniously devised temperature compensator. Within the equalizer cylinder is a floating piston held against line pressure by compressed air in the chamber above the piston. The piston has two diameters, as does the cylindrical body into which it closely fits. One side of the line has access to an area under the piston head; the other side to a chamber of equal volume formed by the piston flange and the equalizer body. Fluctuations in fluid temperature accompanied by variations in volume result in variable displacement of the piston. The force exerted by the fluid's expansion or contraction is balanced by an opposing force exerted by the compressed air in the cylinder above the piston. Thus equal volume of hydraulic fluid is maintained in both sides of the line by displacement of the piston, regardless of rapid temperature variations.

The effect on metal parts of continual exposure to unfavorable conditions similar to those encountered in marine work has been given careful attention. Exhaustive tests have resulted in Adel ISOdraulic units being made of materials which are either non-corrosive or have been treated to render them impervious to corrosion. Many parts are made of stainless steel, especially processed to remove any minute foreign particles which, if not eliminated, would be potential sources of corrosion. They are heat treated to develop full strength and surface hardness. Aluminum alloy parts are anodized and then painted to render them corrosion resistant. As there are no moving connecting parts, it is a simple matter to effectually eliminate corrosion by painting exposed metal parts with bitumastic paint after they have been installed.

Naval architects readily appreciate the ease with which these systems solve their control design problems. They can be worked in at any time during the progress of a design, or even after a project has been completed. Connections between the system units of small-diameter tubing can be conveniently run anywhere in a small space; through water-tight bulkheads; around obstructions through deck flooring; between partitions; or in existing conduit. Thus space and installation time is saved and the designer is freed of complications.

Marine Applications

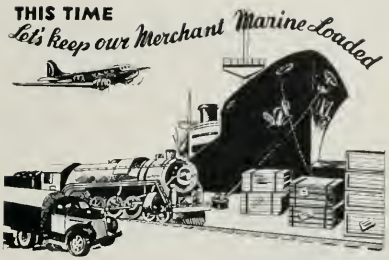
On Army tugs designed and constructed by the Ackerman Boat Company, pneumatic steering is controlled by ISOdraulic systems. Two master units are installed: one mounted on the steering control pedestal located in the front pilot house, the other in the after deckhouse. Movement of either master control lever by the helmsman is instantly translated into smooth, precise control over compressed air valved into the pneumatic cylinders connected to the ship's rudder. The installed system includes the hydraulic lock previously referred to, and permits rudder settings to be constantly maintained regardless of rough water or engine vibration.

On Army Air Force crash rescue boats both engines are separately o

(Page 184, please)

Pacific WORLD TRADE

By T. Douglas MacMullen



eign Trade and the ional Interest

By Amos E. Taylor

ctor U. S. Bureau Foreign and Domestic Commerce.

ur interest in foreign trade per- an approach from two distinct ts of view. In one case we are erned about the machinery of loping markets, filling orders and icing shipments, together with ne procedures and legal forms es- ial to getting goods into the ds of various types of buyers ad. In the other we are inter- l in economic conditions which ct the general health of the d community. With regard to former I shall have very little to Insofar as you need current in- ation, you know that we are pre- l in the Department of Com- e to serve your needs through field offices and in other ways h help expedite the solution of immediate problems.

want to discuss the larger issues which we are all very much erned at a time when we are still ting our total effort toward the ssful waging of war on many s. At the same time we must ahead so that we can determine shape of things to come in a l which is becoming economi- more and more interdependent. important that the world in h we expect to do business be in l economic health throughout ears ahead. We cannot sell to a world, nor can we do business in a community which is in a state of continuous turmoil and unsettlement.

Many things need to be done in order that we may be reasonably sure of achieving our objectives. Not only must many things be done, but they must be done in proper sequence. Efforts in many fields of undertaking need to be synchronized so that our abilty to produce and to distribute what we produce will not be made fruitless through misunderstandings and through failure to operate along parallel and constructive lines. That we can produce goods and services on extraordinarily high levels has been amply demonstrated; at any rate

(Continued on page 167)

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NEXT MONTH

Cartels

Port Operations in Relation to World Trade

Rubber is Two-Way Trade

Russia's Post-War Trade

Who Cares About Exports?



Amos E. Taylor

"A Nation's Seaborne Trade is the Lifeblood of its Power, the Assurer of its Credit, and the Purveyor of its Comfort." —*Admiral Mahan.*

Key Factors in Matson's Post-War Operation



W. P. Roth

By W. P. Roth
President Matson Navigation Company

The pressure of interest in the post-war future of transportation on the Pacific is mounting constantly. But like rising waters behind a dam, it is still held in check by the war. That barrier conditions all planning and even all predictions.

Yet this widespread interest cannot be ignored. Issues of far-reaching importance are at stake. It would be worth much to businessmen who had established trade on the Pacific before the war to know exactly how and when it can be resumed—and under what conditions. Diplomats and statesmen, economists and political scientists would gain much light from a clear pattern of international post-war trade on the world's greatest ocean. Outnumbering all the others by millions, American tourists are already impatient to visit islands and lands made magnets of travel by war; they, too, are eager to know when and how.

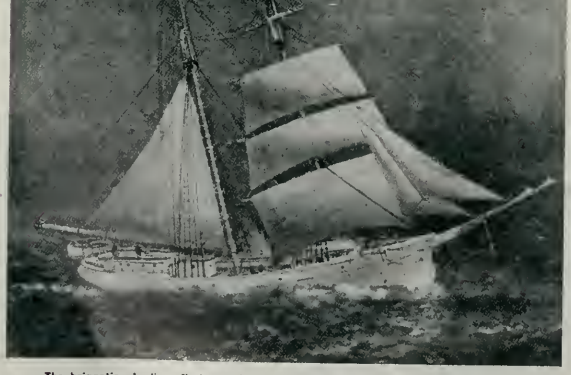
But as yet no one can respon this interest with precise stateme To begin with, both commerce travel are going to be profou affected by the peace settlement will, without doubt, embody ag ments and controls which will a the operation of every internati transportation system. Until t agreements and controls are kno no carrier in foreign trade can m definite pronouncements regard service.

But in spite of these uncertaint some light can be thrown on M son's future operation, for we speak with some definiteness rega ing three major factors that shape Matson policy.

The first is Hawaii. These isla are the pivot on which the Mat operation has revolved for m than sixty years. They will contin to hold this cardinal importance our line. Whatever Hawaii's ov seas transportation needs may come, we shall maintain our tra tional policy of doing our utmost meet them.

You have only to read the curr news to realize that they will greatly enlarged. The islands ha already added to their stature duri the war and they will augment it s more, for they have become t pivotal point in a much wider sph of American interest. That mal certain a substantial increase in b freight and passenger traffic betwe Hawaii and the mainland. We thinking in terms of at least 100,0 passenger bookings per year—doub the prewar total.

The second key factor in Mats Line policy is the South Paci



The brigantine Lurline, first vessel ever designed and constructed especially for the Hawaiian Island trade. Of 359 tons, she was built according to the ideas of Captain William Matson in 1887. Of her cost of $32,000, one-quarter was supplied by Captain Matson and the balance by Island interests.

Pacific
WORLD
TRADE

nething over a decade ago, at a
which many thought too great,
eanic put two newly-built liners,
Mariposa and Monterey, into an
irely new type of service between
United States and the British
mmonwealths of the South Pacific.
a few years it progressed slowly
r great obstacles, including a
ld depression. But it did progress
high point, and was the means
building a store of good will in
v Zealand and Australia that has
me a cardinal consideration with
Matson Line.
War has added greatly to the im-
ance of this service, because it
brought New Zealand and Aus-
tralia into a closer and more vital relationship with the United States than ever before. Matson Line recognizes this in all its implications for post-war service.

The third key factor in our future planning is aviation. It is closely involved with the other two factors, Hawaii and the South Pacific. We have made application to the Civil Aeronautics Board for permission to operate air transport between the mainland and Hawaii and between the United States and Australia.

Matson is in a position to invest these air services with unique advantages. It has shown by more than sixty years of successful operation that it has the "know-how," the operating personnel, the knowledge of the Pacific and of the characteristics of the trade over these routes to do an outstanding job.

No plans for Matson's post-war operation can be made with complete finality until decisions are reached on these applications by the Civil Aeronautics Board. But this much is definite, that we plan to restore all our pre-war services on an expanded scale, replacing lost or war-worn equipment with speedy new craft of the latest design, and meeting every requirement of augmented trade and travel over our established routes.

Matson Made History In the Pacific

ere's naught so easy, but when
it was new
med difficult of credence; and
there's naught
great, so wonderful, when
first 'tis seen,
men will later cease to marvel
at it.

—Lucretius.

Most people think of the Matson Navigation Company as just a big successful steamship business. Its position had to be earned, however, and a strong factor has been its willingness to pioneer.

Capt. William Matson was a pioneer. He started the first direct service from the Island of Hawaii to the mainland after purchasing, in association with plantation operators, the three-masted wooden schooner Emma Claudina, on which he served as master. That was in 1882.

In 1887, Capt. Matson and his associates constructed the first vessel designed for the Hawaiian trade, the brigantine Lurline. Its passenger capacity was 4. Several other ships were added, and one of them, the Roderick Dhu, was one of the fast-

Present-day liner Lurline at Pago Pago, American Samoa.



Pacific WORLD TRADE

est ships of her time. Competition developed when the Planters Line acquired a fleet of ten sailing ships, but when, in 1901, the Matson Navigation Company was organized, the fleet of the Planters Line was acquired by the new company and the Planters Line owners became stockholders with Matson.

Pioneering has continued right down to the present.

In 1902 the Matson company rebuilt the steamer Enterprise for the Hawaiian trade. This was the first off-shore vessel on the Pacific using oil for fuel and was the first fitted with commercial wireless.

In 1917 the Maui was the first high powered gear turbine vessel operated on the Pacific. Other innovations were the aft engines and side ports. In 1920 the Matson freighters Manulani and Manukai, each of 13,180 tons cargo capacity, were the largest freighters on the Pacific and the largest freighters ever constructed in American yards. When in 1933 the third Lurline was placed in service, the accommodations for passengers had increased to 701, and, with the Malolo, Mariposa and Monterey, she was the pride of the Pacific.

In 1939, with war approaching, the Matson freighter fleet was in process of being replaced by the Maritime Commission's C-3 ships, but only a few trips had been made



Matson Building, San Francisco. Built in 1924 to serve as Matson headquarters.

when they with the entire Mats fleet of 49 vessels (including th of the subsidiary Oceanic Steamsh Company) were taken over the War Shipping Administrati Twelve of the older vessels had be disposed of to the British and oth allied interests, and of the remaind one-third have been lost by ene action.

Matson has earned the loyalty its Hawaiian trade. When in t first world war competitive servi were discontinued in favor of m profitable operations in the Atlan Matson alone continued its Isla operations. These operations requ considerable flexibility. Only tw thirds of the fleet are normally e ployed throughout the year, oth vessels being held for peak requi ments and the operations requ interchangeable types of vesssels different seasons. A tanker is op ated for the transportation molasses, and lumber and ceme take special types of ships. The ficiency of Matson's conversion fa ities was proved when on Decemb 9, 1941, the Lurline arrived at S Francisco and within 5 days was modeled, re-equipped and outfitted transport 3500 troops, and sailed December 14.

The ability of the Matson orga ization to adapt itself to new con tions in continuation of its stur past is shown in its determination protect its Island trade by providi overseas air service in connecti with its surface lines. The shippi industry and the country as a wh hopes for it success.



West Coast Trade Prospects

By Eliot G. Mears

Mr. Mears is Professor of Geography and International Trade, Stanford Graduate School of Business.

Organizer and director, American Commercial Attaches in World War I and later American Trade Commissioner in Greece and Turkey.

Assistant Director, Shipping Requirements Division, W.S.A., 1942.

Author: Modern Turkey, Greece Today, Principles and Practices of Cooperative Marketing (with M. O. Tobriner), Resident Orientals on the American Pacific Coast, Maritime Trade of Western United States, Pacific Ocean Handbook.



Eliot G. Mears

The future trade prospects of the Pacific Coast consist of many imponderables. Among them must be considered the length of the war, the precise nature of the peace settlements, and, of course, the economic problems which come as an aftermath. It is my experience that there is a great reluctance on the part of any person, or any authoritative group, to indulge in prophecies. I share this view. Yet there is no reason why we cannot speculate on various factors, for unless we do so, the future will be all the more uncertain. Surely, we can the gainers if we do no more than single out and analyze briefly the pertinent trends and possibilities.

Although the statement is often made that history repeats itself, unfortunately for the practical man the statement is not too true. Changing circumstances alter basic conditions, so each period must be considered in its own perspective. Never before has there been a war on such a mammoth scale; never such destruction, such misery, or such a high degree of unsatisfied wants. If we could assume sufficient purchasing power and means of financing, there would be an unlimited market somewhere in the world for everything which the West Coast could possibly produce.

But what is the situation so far as we can envisage it, having in mind primarily commodities which might move by water? Thus far, there is no indication that the products which loom most important in foreign and domestic trade prior to 1941 should not resume their former importance in peacetime commerce. The raw and simple products obtained from land and sea account for over three-fourths of our pre-war exports. In the Northwest these are primarily forest products, fish, cereals and flour; in California, many types of fresh and prepared fruits and vegetables, fish, and minerals (chiefly petroleum products). Other merchandise consists of chemicals and miscellaneous manufactures. Our waterborne trade, therefore, has consisted largely of bulk products consisting of foodstuffs and raw materials which are dependent for their markets on other parts of the United States, as well as foreign countries.

There is no reason to believe that the foregoing commodities will not continue to dominate our seaborne trade. Wartime production has added countless new products, including those associated with the airplane industry and the working of less common minerals, but probably agricultural, forestry, and mineral products will continue to dominate outgoing movements. Nor can we for a moment overlook our economic dependence upon imported tropical raw materials and foodstuffs. The newer industries on the West Coast have been financed and controlled to such an extent by the Government that their reconversion and future prospects constitute a real question mark.

West Coast trade has three features which are not always recognized. First, the domestic trade is much larger than the export trade; in other words, our prosperity depends more on the condition of the American market than the foreign market. Second, internal or domestic shipping is more important than foreign shipping. Despite our enthusiastic attention to Asiatic and other markets, we should not forget that domestic shipping, as well as trade, exceeds in value that of foreign shipping and trade. Third, distance is only one factor in the geography of commerce. Actually more important and basic is our efficiency of production compared to that of our competitors; and this applies not only to foreign competitors but also to that of other sections of the United States. To illustrate, the commerce of the East Coast with transpacific countries in certain commodities often exceeds that from the West Coast, so it should be recognized that our chief rivalry may be with American rather than with foreign producing and consuming areas.

Since it is obviously impossible to forecast post-war trends without a more definite knowledge of the war's progress, Government policies and international understandings, the best we can do is to enumerate the leading factors and comment briefly



Import

on each one. The crystal-gazing that has been done to date has usually overlooked one or more items, any one of which can upset the most thoughtful predictions.

The progress of the war is highly important; on the West Coast, practically everything is geared to this program. Every day that war lasts, there is more destruction in the world and more uneconomic production so far as peacetime trade is concerned. Which leads us to reflect not only that the reconstruction possibilities are becoming enlarged, but also there is the stark question of the disposal of surplus goods. Will the latter constitute the serious problem which existed after the last war, when the supplies abroad acted as deterrents to our commodity exports, as well as here at home, where our markets were temporarily glutted? Too little attention has been given to this question of unused stocks of nearly every conceivable type of producer and consumer goods.

Governments are certain to exercise a far greater measure of control over trade than in pre-war days. In the case of small or weak countries this situation is obvious, yet the strategic and national interests of all countries will be shown in their legislation and policies regarding import tariffs, exchange controls, quotas, and loans for immediate consumer requirements and for long time capital improvements. In addition to these highly important political-economic measures, there should not be overlooked Lend-Lease, UNRRA, and other international operations.

It is not sufficient to consider the policies adopted by the United States alone, since those of our customer countries react directly and indirectly upon our own economy. Businessmen will be required to keep closely in touch with changing Government policies, which places the West Coast somewhat at a disadvantage because of geographic distance from Washington and most world capitals.

West Coast developments will be influenced considerably by actions of state and local authorities. For example, legislative measures being introduced at Sacramento can have a decided effect with regard to reconversion of industry and to development of resources. The interrelationship of Federal, state and local authority is an uncertainty at this time.

The competitive position of natural versus substitute products is exceedingly important. There can be no disagreement regarding the mutual interaction of exports and imports, for unless we are willing to receive imports from other countries, which enable them to pay for our products, our export possibilities will be seriously curtailed. On the West Coast we are important markets for tropical and semi-tropical products of Southeast Asia, notably rubber, vegetable oils and fats, quinine and abaca', so the imposition of a duty or higher duties on these and other products would operate to our disadvantage with respect both to trade and shipping. Since the prosperity of most Asiatic countries is tied up with these products, they cannot be expected to become important buyers again unless we deal with them on a reciprocal basis.

Another quandary is the "timing" of reconversion in our new and vast industries; this should be reckoned as a domestic Coast problem, and also as to our standing with respect to the rest of the U.S.A. When funds will be allocated, how they will be allocated, and the confidence businessmen will have in future changes are perplexing questions. Furthermore, writing as an economist, I cannot pass over the consideration of "short time" and "long time" operations. Among experts, there appears to be a majority opinion that in the two or three years after war is concluded, the private unexpended savings and postponed consumption should result in a business boom, with real danger of runaway prices. There is less agreement regarding the subsequent years, especially five to twenty years ahead, for reasons which are perfectly understandable. For peacetime conditions will be based partly on national defense, and thus future Government policies are uncertain. When Adam Smith wrote, "defense is more important than opulence," his words had an exceedingly prophetic meaning.



Export

In conclusion, West Coast Trac prospects will be most promising we can attain highly satisfactory co ditions of efficient production an full employment. What we shoul strive for is to attain the greate efficiency in production, which, aft all, is the real economic goal of max mum industry and trade. The actu wages paid labor are a far less conse quential factor than competitive eff ciency; this is not only true with r spect to other countries but also t the Atlantic Coast, Middle Wes and South. Our commercial self-in terest requires that our potential cu tomers should be prosperous. From regional as well as national stanc point, the length of the war, its rat of destruction, the nature and valu of the stock piles, Government pol cies, and the state of the world ar dynamic influences.

Based on wise Government policie and constructive thinking by bus nessmen, the future trade of th West Coast can greatly exceed tha of any pre-war period. Our export for example, which have been ap proximately one-eighth that of th country's total, can be greatly ex panded. My guess is that our post war trade will be considerably greate than that before December, 1941. I view of the outstanding military, in dustrial, and transportation Wes Coast developments during wartime we should have an increasing shar in America's economic future.

Pacific WORLD TRADE

The Philippines

GIBRALTAR OF OUR ORIENTAL TRADE

s MacArthur strides through regidor and the fleet enters Ma- l Bay, the reestablishment of lanila as a trading outpost in the rnt becomes an early probability. ' expected that the post-war trade he entire Far East will be cen- d in Manila, and its political and nomic future will be of very great portance.

/hen General MacArthur left regidor, he was quoted as saying : "there, along with the soldiers died there, lies the nation's or: it must be retrieved."

his seemed at the time to be a ic ending to the upward progress he Philippines, dating from the ender of Manila to Admiral ey in 1898.

iscovered in 1521 by the Portu- e Magellan, under commission the King of Spain, the Philip- s had become a permanent Span- olony in 1565. Spanish rule con- ed for 323 years, when the ty of Paris ended the Spanish- erican war in 1898. American reignty over the Islands dates July 4, 1901, when William H. Taft was inaugurated the first civil governor.

In 1935 the Philippine Commonwealth came into being, with an American High - Commissioner appointed as representative of the President of the United States. The Tydings-McDuffie law, under which the new regime was established, provides for complete independence of the Philippines on July 4, 1946.

The Commonwealth consists of 7083 islands, including many unnamed reefs and atolls. With a total land area less than one twenty-fifth of the United States, the coast line is nearly twice that of the United States. Ninety-four per cent of the total area is contained within the eleven largest islands. The topography is quite varied, with elevations ranging up to nearly 10,000 feet. The climate is tropical and the soil fertile.



Brigadier General Carlos P. Romulo, Resident Commissioner at the Philippines to the United States. He was aide to General MacArthur at Bataan and re-entered the Philippines with him and President Osmena.



Sergio Osmena
President of the Philippines.

The sixteen million inhabitants include over 40 ethnological groups, speaking 80-odd languages and dialects, but English is the official language. The Smithsonian Institution traces racial strains from Arabia and North Africa, as well as from China, India and the East Indies, and there are records in China of trading that go back 1000 years. Of the entire population, the 1939 census revealed a total of only 167,000 non-Filipinos, of which 117,500 were Chinese, 29,300 Japanese, 8700 Americans (exclusive of Army and Navy), and 4600 Spaniards. Manila is the capital and chief port, Cavite was the chief naval base, and Corregidor the Army post. All are on Manila Bay, which is 6220 miles from San Francisco, 1760 miles from Yokohama, 1370 miles from Singapore and 640 miles from Hongkong.

Although less than 15 per cent of the total area is cultivated, the Philippines are preponderantly agricultural. The chief products are sugar, rice, cocoanuts and abaca, although the Japs are reported to have substituted cotton on much of the sugar land, sugar not being very important in the Japanese diet.

For many years sugar has been the most important export and money crop. Marketed entirely in the United States, shipments in 1940 were valued at over $47,000,000, or 30 per cent of the total export trade.

Over 90 per cent of the cocoanuts grown in the islands are converted into copra, of which the islands are the world's leading exporter. Some cocoanut oil is extracted locally but most of the processing is done in



Manila's famous Pier 7, bombed by the Japs and later by the Americans, after which it was blown up by the retreating Japs.

mills around San Francisco Bay. Cocoanut products accounted for 16 per cent of total Philippine exports in 1940.

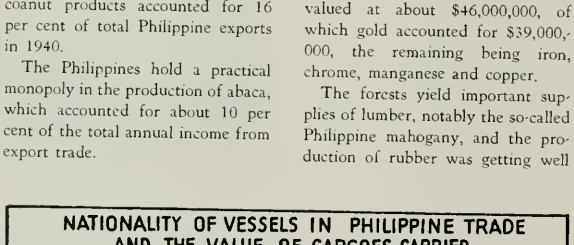
The Philippines hold a practical monopoly in the production of abaca, which accounted for about 10 per cent of the total annual income from export trade.

In 1940 mineral production was valued at about $46,000,000, of which gold accounted for $39,000,000, the remaining being iron, chrome, manganese and copper.

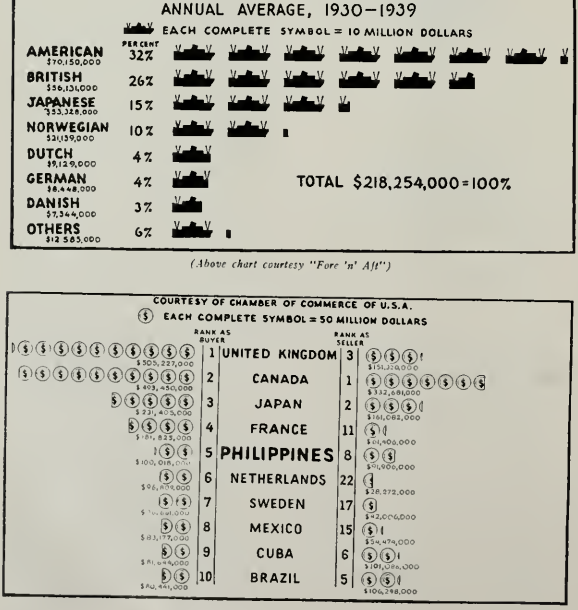
The forests yield important supplies of lumber, notably the so-called Philippine mahogany, and the production of rubber was getting well started. Tobacco, embroideries, h. and pearl buttons just about co plete the export list.

The place of the Philippines United States export trade is in cated in an accompanying cha which shows the Commonwealth our fifth best pre-war customer a our eighth best pre-war supplier, a its importance to the shipping ind try from a cargo standpoint is in cated on another chart. It is probab that a post-war chart of this natu would show fully 75 per cent of t cargo being carried in Americ ships.

The geographical position of t Philippines in relation to oriental a South Seas commerce will probal result in a very greatly increas volume of trade being centered the Joseph F. Marias of San Francis who was for six years in charge U. S. Shipping Board activities fr Siberia to India, and for two ye president of the Bank of the Phil pines after the last war, and w has been an important advisor in t post-war Philippines program, h advocated a sort of "Free Port" Manila or at Subic Bay, which just north of Bataan, from whi cargos could be distributed to t



(Above chart courtesy "Fore 'n' Aft")



re Far East without encountering
f restrictions. He urges that own-
ip of such a port be retained by
United States. The entire ques-
of tariffs, however, is a part of
program of the Filipino Rehabili-
on Commission, which is provided
in the Independence Law, and
ch had made some progress be-
the war started. The invasion
of course, completely upset all
s for the future, not the least
which is the tariff program.
he Tydings-McDuffie Act grant-
ndependence to the Philippines
ecome effective July 4, 1946, af-
ten-year transitional period, dur-
which free trade relations with
United States would continue,
pt that import quotas were fixed
ertain products, as follows:
aw sugar, 800,000 tons per year;
ied sugar, 50,000 tons per year;
anut oil, 200,000 tons per year;
a cordage, 3,000,000 pounds.
xcess over these quantities could
imported but would pay full
ited States duty. All other Philip-
products were to pay export
s, starting with 5 per cent of the
lar United States tariff in 1941,
easing by 5 per cent each year
l 1946.
view of the war's interference
this schedule, and in view of
handicapped post-war position of
Philippines, it has been recom-
ded by many influential groups
a further ten-year period be set



**F. Morias, who proposes a free trade
nter, U. S. owned, near Manila. Mr.
orios was for five years in charge of
lipping Board operations in the Orient,
d for two years president of the Bank
the Philippines.**



General MacArthur

Crusader for his country's honor. "Manila," said MacArthur, on restoring civil government to President Osmena, "will be the symbol of Democracy in the East."

(Photo courtesy of San Francisco Examiner.)

up after reoccupation, and that there be mutual free trade between the United States and the Philippine Islands as to both tariff and quota. One group urges that the free trade period be extended to 25 years.

It is possible that the War Damage Corporation, which has been collecting premiums from domestic home owners with practically no opportunity to disburse the receipts, may extend its protection to war damage in the Philippines. Although not a part of the law, Jesse Jones issued a directive to that effect before his resignation. Claims under this directive were to be recognized from property owners and business interests, but were not to cover certain agricultural losses, such as the destruction of sugar plantations in favor of cotton (it takes three years for sugar cane to mature).

The War Damage Corporation, with progress toward reestablishment of order, is being urged to advance 90 per cent of losses, and the Reconstruction Finance Corporation is being urged to underwrite banking facilities, wholesale and retail establishments and transportation services without waiting for final surveys and audits.

It is to the advantage of the business world that every possible assistance be given the Filipinos and those who have their interests at heart. It seems certain that in the fire of trouble the gold of friendship between our two peoples has been refined, and that MacArthur's well-planned campaign will appear as a bright page in the history of civilized relationships.

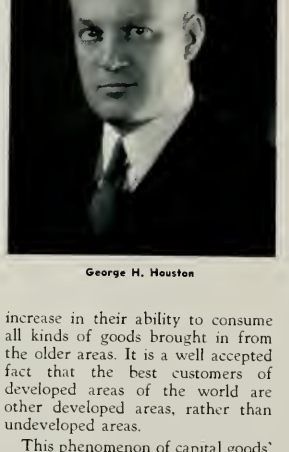
(Map of the Philippines on page 167)

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Exportation of Capital Goods

By George H. Houston

Mr. Houston was for nine years president of Baldwin Locomotive Works and head of its various subsidiary companies; former partner of George W. Goethals; now partner with Hendrik R. Jolles in the firm of Houston and Jolles.



George H. Houston

One of the outstanding characteristics of the post-war economic development of the world is going to be the increasing tendency to convert raw materials into finished products at the points of greatest overall economy and convenience in the natural movement of raw materials from their sources to the areas of their consumption as finished products. This trend will mean a constantly increasing diffusion of capital goods (that is, the **facilities** used for production and distribution) throughout the areas of the world at present undeveloped industrially, with a corresponding relative reduction in the concentration of capital goods in the older so-called industrialized areas. This change does not mean necessarily that the older industrialized areas will become **less** industrialized, but rather that the undeveloped areas of the world will become more industrialized. This will mean a rapid increase in the productivity of the populations so industrialized, with a corresponding increase in their ability to consume all kinds of goods brought in from the older areas. It is a well accepted fact that the best customers of developed areas of the world are other developed areas, rather than undeveloped areas.

This phenomenon of capital goods' diffusion, as it occurs, will result specifically in an increase in the volume of export of capital goods from industrialized communities and particularly from the United States. The export of capital goods to undeveloped localities, to be effective, however, must be accompanied simultaneously by the export of the **corresponding techniques** involved in the use of such capital goods and of the arts of industrial and commercial organization, management and administration required to apply these techniques effectively. Exportation of capital goods to unindustrialized areas of the world is very different from the export of capital goods to Continental Europe or to Great Britain, where techniques generaly are well established and where the arts of management and administration long have been highly developed, but even in these communities it has been found necessary at tin for instance following the first wo war, to export techniques and ministrative methods applicable mass production in order effectiv to establish mass production in sc of these old-established localities, cause such localities had not had vious experience in genuine m production.

This industrialization of un veloped areas should, therefore, looked upon as involving not me the marketing of capital goods, also the exportation of the techniq and managerial arts of product and distribution, without which acquisition by such localities of ac tional capital goods will not be v effective in raising their econo level. The post-war exportation capital goods to undeveloped ar represents large opportunities American industry, but it represe also large hazards and waste of c ital if undertaken without car planning and without the effec exportation of the related techni and managerial arts. This tre which is likely to become very pow ful in the next two or three deca represents a vital, long-term cha in the distribution of employed pc lations. If carried on too rapidly without proper understanding, it cause serious economic and sc dislocations, and, in extreme ca immeasurable hardships to the pc lations whose economic activities thus being basically modified. greater part of all people livin undeveloped areas exists close to land on a subsistence basis; they duce locally what they consume, limit their consumption largely what they produce individually in small local groups, with the imum margin of output above ac subsistence necessities. The in trialization of each such locality volves of necessity the diversion a part of its population from sistence activities to production a ities more or less unrelated to

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diate consumption needs. These
v production activities include,
, the creation of the facilities of
duction of which imported facil-
s frequently are only a small part;
second, the production of semi-
shed products which frequently
be converted into goods available
human consumption only by
ther fabrication and distribution,
ending frequently over long pe-
ls of time and great distances. It
inherently necessary, therefore,
such industrialization be under-
en with the utmost regard for a
tinuation of the supply of con-
ier goods upon which the entire
ulation must rely for subsistence
le laying the foundation, through
ustrialization, for largely increased
plies of consumer goods in the
e or less distant future. Any
ure to recognize and give effect
his principle is likely to result in
rtages of consumer goods needed
current subsistence, with conse-
nt suffering and deprivation on
part of the subject people. This
nomenon of too rapid industrial-
ion was tragically portrayed in
early days of the industrializa-
of the Soviet Union, when so
e a portion of its population was
erted from subsistence production
the preparation of facilities for
hanized production that the pro-
on of subsistence supplies was
ously curtailed, with the result
during the period of adjustment,
ering several years, untold num-
s of people suffered and died for
of subsistence.

Too rapid development of such
ertakings involves the hazard of
eloping organized groups that are
ond the competence of the com-
nity to cope with socially and
tically, with the result that se-
us social, political and economic
ocations are likely to develop,
h the corresponding reactions and
rictions.

should further be observed that
h industrialization involves the
ation and training of groups of
viduals competent to organize,
nage and administer the affairs of
industrial enterprises so created.

Unless a community to be thus in-
trialized is willing to go through
long, slow process of evolution
ough which the related techni-
s and managerial arts were
lved in the older industrialized
mmunities, these techniques and
arts, of necessity, must be supplied by **importation** from such older communities. Such importation is generally practicable in the first instance only by sending into such communities trained individuals from the older localities. Such individuals should be competent not only to create, manage and administer, but also to teach and train the people of the community being industrialized so that their successors may ultimately be derived from the people of such localities. This procedure should be followed as soon as possible, however, by the sending of the carefully selected youth of such localities back to the older areas for specialized training. In general, this procedure should be supplementary to the first, as there is little reason or incentive for men to seek training in industries that do not actually exist. Much more dynamic interest will be developed on the part of those being trained



if the industry in which they see opportunity is first established and its practical operation demonstrated, and if prospective trainees gain some preliminary experience in such local enterprises before they begin their training in the older centers.

As time goes on a third phase of training should develop in which the youth of such localities seek educational opportunities and a certain amount of practical experience in the older centers before they begin any work in their home localities.

There is much confusion of thought as to the sequence in which ventures in industrialization should be undertaken in an undeveloped locality, and, of course, no rigid formula can be laid down for universal application. If, however, a locality possesses raw materials required elsewhere throughout the world, an essential step in any such movement would naturally be the extraction of such raw materials and their exportation to existing conversion points where they may be processed for subsequent distribution with the least capital expenditure and the greatest immediate benefit to all concerned. Such exports will supply much-needed cash income and foreign exchange for further developments. It is not to the long-term interest of most localities, however, to permit this process of extraction and exportation of raw materials to become fixed to the exclusion of local conversion of such raw material into finished or semi-finished products. History has shown that any such attempt will be followed inevitably by local pressures which at times may become serious and even destructive. Efforts toward the local conversion and fabrication of the raw materials of a given locality should always be encouraged in every reasonable way consistent with the safeguarding of the capital investments involved therein.

Another consideration that requires continued emphasis in connection with the undertakings of this character involving the use of foreign capital, techniques and management, is the recognition given by such foreign interests to the right of the community to benefit directly from such extraction and export of its raw materials, through the collection of royalties or taxation upon the products thus extracted and exported. It is very essential that the people of any such community see a direct benefit being derived by it from the processes of raw material extraction being caried on. The history of undertakings of this character has shown all too frequently a tendency to withhold such benefits from the local community. An example of the effect upon a community of the application of this principle is seen in the immeasurable benefits to the State of Texas that have been derived from its direct participation in the production of wealth by the petroleum industry of that area.

In addition to the extraction of raw materials for export there are certain basic industries, the development of which will be found advantageous and, in fact, essential to the further industrialization sought for. Extreme care must be taken, however, in seeking to establish basic industries, such as the production of pig iron and steel from ore as differentiated from the reworking of steel from available scrap, which require operations of single units at volumes substantially beyond the

ability of the locality to absorb the output or to export it on a truly competitive basis. Many such ventures have been the burial place of private capital, both local and foreign, even though the local community might in time grow up to the capacity of the enterprise.

Aside from the extraction and conversion of raw materials for export and the development under favorable circumstances of certain essential basic industries, the industrialization of undeveloped localities should begin, in general, with the fabrication from local raw materials of finished products needed for local individual consumption. Again, this process should not be held back by efforts to safeguard capital investments in older communities, as to do so will in the long run generate reactions still more unfavorable to the older communities.

There is considerable planning at the present time for the development in remote and relatively primitive localities of the production of highly developed and intricate mechanical devices for which previous local experience is entirely unfitted. With, of course, many exceptions to the general rule because of particular circumstances that may exist in a given locality, these grandiose and intricate projects should be discouraged in favor of the starting of small and simple projects more closely related to the comprehension and existing abilities of the people concerned. Future industrialization should evolve from these simple beginnings into larger and more intricate undertakings, each new step being tested carefully as the evolutionary process unfolds.

Plans for industrialization in different parts of the world involve the further determination as to whether it is to be undertaken by private enterprise—that is, by the use of property owned by individuals and private groups and controlled by its owners—or by some form of public enterprise—that is, by the use of property owned and controlled by the related government, or by some combination between partial government ownership and partial private ownership, with the consequent intermingling of the ownership interests in the subsequent control and management of the undertaking. In many places governments are actively promoting industrialization; in some instances by the development of great government projects, but more frequently by efforts to bring about the importation of foreign capital and equipment, with or without its related techniques and management, financed wholly or in a large part by the importing medium. In some instances such projects are sound and success may reasonably be anticipated, but all too frequently such projects are not carefully thought out with an adequate understanding of local conditions and opportunities and with realistic provision for the safeguarding of the capital involved. Generally such protection is inherently impracticable because of the nature of the political institutions and social and economic conditions under which such investments must be made. In many instances such undertakings will not prove to be of long-term advantage to American business.

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This whole concept of industrialization of outlying areas is beginning to be of general interest in the United States—first, because of the hope that it will contribute to the solution of the economic and social problems of the world; and second, because of its potential contribution to post-war employment in the United States. These hopes have substantial foundation, providing such undertakings are soundly planned and effectively carried out. If, however, they are started with the superficial planning and are carried out with the incompetent performance that have been characteristic of many such undertakings in the past fifty years throughout many parts of the world, the results will be tragically disappointing, involving loss of opportunity and capital as well as loss of the great social and economic benefits that would have resulted from successful accomplishment.

The American Government and American business are faced today with the concrete question of what can be done of a genuinely constructive character to forward this move ment and at the same time to mini mize the hazards and avoid th obvious pitfalls that exist. **There i still much provincialism in the out look of American business towar foreign trade, in that the greater par of it has not had to seek foreig trade in the past and has little under standing of how to find it now.** Als past experience has not always bee encouraging. While many large cor porations are prepared to carry o foreign distribution effectively an economically, relatively few enter prises in the capital goods industrie have the necessary volume or ar otherwise qualified to promote an successfully carry on the sale in un developed areas of the world o highly specialized machinery an equipment or to export technique and management in the arts whicl they serve domestically. In some in stances it must be recognized tha their domestic customers are mor or less opposed to their developmen of foreign sources of production fo articles manufactured domestically i their respective fields, so that th capital goods producer is frequentl handicapped not only by lack of ex perience and contacts, but also b fear of antagonizing his domesti customers upon whom he must de pend for existence. Further, th promotion and handling of foreig sales of capital goods, including th exportation of techniques and man agement, is too costly to be carrie on separately by each of a group o competitors producing like article of capital equipment. Such sale effort is practicable for the small an medium-sized enterprise only by co operation and joint action betwee such competitive producers. Als frequently it must be carried on i a way that is more or less independ ent of the individual manufacture of capital goods so as to divorce hi from the onus arising from the de velopment of foreign producers o finished consumer products which hi domestic customers may think wi be potentially competitive with thei own.

Regardless of his individual com petence, the sales agent operatin in a foreign field is not an effectiv solution to this problem, althoug frequently he will be a potent facto in the effective consummation of i individual transactions. Of necessity h

(Continued on page 165)

United Nations' Conference In San Francisco

By Dr. Henry F. Grady

Dr. Henry F. Grady, president of t: San Francisco Chamber of Com- rce, and an authority on world economics, has issued the following statement:

'The United Nations conference to be held in San Francisco on April 2 is the sequel or concluding chap- to, as it were, to the Dumbarton Oks conference, where the pattern f world peace and order was blue- printed in preliminary form.

'The Dumbarton Oaks conference undertook to draft preliminary pro- posals for a world organization, which will be called 'The United Nations,' and these United Nations will meet, through their duly ap- pointed delegates or representatives, at the conference scheduled for San Francisco, where they will prepare the final detail the chapter of a world peace and economic order.

'While much of the emphasis at Dumbarton Oaks was upon the ques- tion of greatest concern to the world, namely, security and lasting peace, the proposals nevertheless outlined the entire framework of the general international organiza- tion. As was stated at the time, the proposals have gaps to be filled in, but it is understood that the most im- portant of these have been filled in at Yalta. It becomes the task, there- fore, of the San Francisco conference to round out, and give substance to, the preliminary structure designed at Dumbarton Oaks!

'It is encouraging to note that steps will be taken before the end of the war definitely to set up the peace machinery. This will serve to prevent the dangerous hiatus be- tween war and peace, such as led to chaos and confusion in many coun- tries after the last war and which certainly developed conditions that had a bearing on World War II.

'I am delighted to know that the United Nations' conference will be held in San Francisco, which will point up the importance to the new world order of the great countries in the Pacific area. And conversely, it is a dramatic reminder to San Fran- cisco of its tremendous responsibil- ities in the Pacific area.



Dr. Henry F. Grady
President of San Francisco Chamber of Commerce.

"The San Francisco conference may well prove to be the most sig- nificent conclave in the history of the human race. If it should be the means of bringing to fruition man's highest aim—lasting world peace and economic order—then it will have earned all the acclaim and his- torical rating that can be heaped upon it.

"It will be a great thing for future generations to hail San Francisco as the cradle of a New Understanding and Organization in international relations, the Queen City of World Peace.

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EXPORTATION OF CAPITAL GOODS

(Continued from page 164)

cannot represent competitive pro- ducers of the same article, and gen- erally speaking, must distribute his attention over so wide a variety of equipment in proportion to the volume obtainable in any one item, that he cannot give concentrated highly-informed attention to each inquiry for a particular article of capital equipment. He must of neces- sity depend upon getting volume with reasonable sales expense for a continuation of his existence. This condition is not conducive to the effective solution of the problems herein discussed.

Joint activity of competitive pro- ducers of capital goods in the export marketing of their products is pos- sible in the United States by the use of sales corporations or associations organized in accordance with the provisions of the Webb-Pomerene Act if such undertakings are prop- erly set up, financed, and managed. In any such project it is essential that provision be made for financing the cost of promoting and develop- ing foreign sales to the point where such activities become self-sustaining through commissions derived from actual sales accomplished, or by con- tinued proration of expense or other- wise. American corporations which have their own foreign sales organ-

izations are able to finance all or a large portion of their foreign sales promotion and development expense out of current taxable income derived from their domestic business. However, this procedure is very much more difficult, if not impossible, for the small business engaged in capital goods production which does not have enough volume to support a foreign sales organization of its own, except by the use of an intermediate organization of this type. This inability to organize foreign sales economically and to absorb the related initial expense out of taxable income is an instance of the handicaps being experienced today by small businesses in the capital goods industries in the United States, in competition with larger companies which are able to support established foreign distribution.

Foreign sales of capital goods were handicapped also for many years by lack of adequate facilities for the financing of such transactions. However, such financing, when the projects are soundly planned and competently administered, is not impossible nor impractical, as has been evidenced by the experience of the Export-Import Bank of the United States and of the Export Credit Insurance Fund created by the London Board of Trade in England following the first world war. The Export-Import Bank has demonstrated that insurance of export credits is not the only way in which foreign sales can be financed, although insurance has certain advantages over other methods of financing small- and medium-sized transactions.

Provision must also be made, however, for the financing of such portion of the purchase price of capital equipment as cannot be financed by these methods. There are many ways of dealing with such junior financing, including the use of (1) capital accumulated in the locality to which such equipment is to go, and (2) capital in the United States seeking investment in such localities. These are all problems that must be considered and dealt with conclusively in the successful development and expansion of the export of capital goods from the United States and in the successful industrialization of the undeveloped areas of the world. Sales companies or associations of the type herein suggested can be made a potent factor in the accomplishment of these objectives.

Air-Steamer Service Should Be Kept Before Publi

"The vital public interest in a strong merchant marine should determine Government policy in deciding applications of American flag shipping lines seeking to engage in overseas air commerce on an equal footing with other nations."

This was the crux of a statement issued by the National Federation of American Shipping on behalf of American shipping lines seeking certificates from the Civil Aeronautics Board to correlate air service with their operations.

Pointing out that our merchant marine is the only great industry 100 per cent engaged in war operations, the Federation's statement strongly emphasizes the necessity for a liberal policy on overseas aviation.

"Of the total of more than 100 American shipping companies now engaged in the vital task of supplying our armies overseas only 8 have sought air certificates," the statement declares.

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"The lack of a Government policy with respect to international sea and air transportation prevents the applicant steamship lines from planning their requirements for passenger ships at a time when their importance as troop transports is being dramatically demonstrated."

Public attention was sharply focused on this point recently when one of the steamship companies was compelled to cancel its application to the Maritime Commission to build three new passenger ships because of the competitive factor of air service.

"This uncertainty on the part of one applicant is common to all the others and becomes aggravated by the fact that the merchant marine of other great maritime powers will almost certainly employ all the advantages of combined ship-air service," the statement continues. "By doing so they will be able to est mate their passenger shipping r quirements in proper relationship t their aviation requirements and thu evolve an efficient unified plan f operation. If the American me chant marine cannot so plan, obviously will be placed at a critic disadvantage. Because of the vit part it is playing in this war ar because of its ever-growing impo tance as an instrument of nation security and economic stability, would seem most unwise and eve destructive to impose further hanc caps upon it."

The Federation's statement mad it clear that the American fl steamship lines applying for air ce tificates sought no preferential trea ment even on the ground of nation defense.

"The applicant companies a only that the circumstance of bein steamship companies, rather tha some other kind of company, be n held against them in the consider tion of air applications," the stat ment continues. "They seek on the right to be considered on equal footing with all other app cants and the determining fact should always be the public intere

"The applicant steamship co panies do not suggest any depart from the principles of limited a selective competition or ask f special treatment of any kind. Th neither suggest nor seek blank approval of their applications. Th reaffirm their belief in the poli of regulated competition in the pu lic interest. The case of each app cant stands alone, to be judg solely by the criterion of pub convenience and necessity and t ability to serve the nation's overs transportation needs.

"It is obvious that all of the stea ship applicants do not believe th they are entitled automatically certificates of operation any mo than to airline applicants. The t should be the number of constr tively competitive services justif by traffic potentials. Which app cant or applicants may be b qualified to provide that service the overall public interest is termined by the Civil Aeronaut Board."

FCIEIGN TRADE AND TH: NATIONAL INTEREST

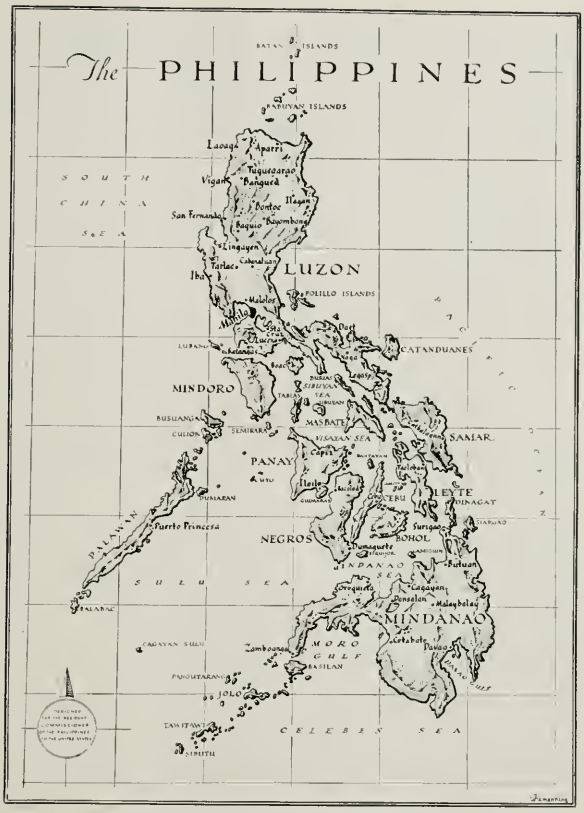
(Continued from page 153)

we have satisfied ourselves that we can produce in time of war to me the requirements of an insatiable customer who is constantly demanding ammunition, food and other materials for waging war. The problem of adjusting our economic machinery to peacetime requirements is rgely one of seeing to it that our productive capacity can be utilized as we for our own personal well-being as or destructive purposes. But this s pt all. Our production machine cannot be kept running unless we in it possible to get goods and service into the hands of those who need hn. If we can solve this problem we shall have found the way to ieleving and maintaining a higher tadard of living in which all may hee.

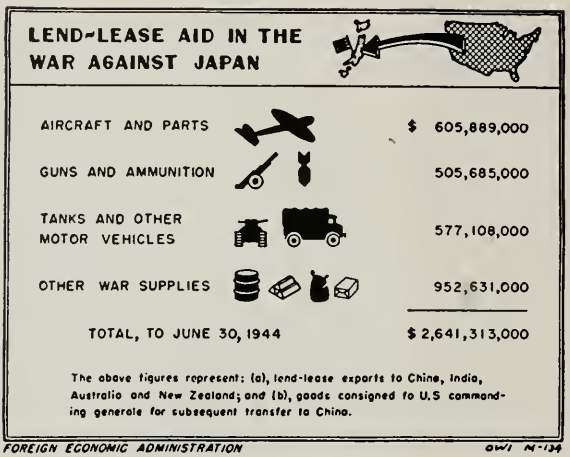
he decisions that need to be made anot be made within a national aeum. By the very nature of the ved economic structure, domestic ra cannot be placed into one comament and foreign trade into anr. Indirectly domestic trade is o large extent international, while hnature and volume of export and mort trade influences in various vas the level and real character of olestic business. This is particuar true in the case of a highly deeped country like the United tes. Even though the export rat of the United States may ape on the statistical records as a elively small fraction of the coun's total output, it has been demontred that this country cannot long e prosperous when the rest of the rld is suffering from depression.

here are of course many who adi this close inter-relationship be n our national economic struc- and the world economy, but h at the same time would attempt shortcut solution on the theory that conomic power does not necessarily ay with it a corresponding respon- ity. One view which is still exsed in various quarters suggests simple solution of keeping both orts and imports at an absolute imum. The theory underlying view would support a maximum ee of self-sufficiency and the tion of measures designed to eve such an objective in as short the as possible. Such a policy aimat economic isolation ignores the nature of the world we live in and disregards the economic and technological changes of recent decades. It overlooks the all-important fact that time and space are steadily shrinking.

Let us examine the problem from another angle. We all agree, I am sure, that no one would seriously advance the view that business establishments in Pittsburgh should sell in Ohio but not in Oregon; or that they might properly sell in New York but not in Canada. We know, of course, the trade of the United States, visible and invisible, with Canada represents one of the largest streams of goods and services flowing across a national frontier anywhere in the world. I doubt whether anyone in either country would seriously suggest that this trade is not mutually beneficial. Thus the further question: If it is appropriate that you sell and buy in Canada, why not in the Far East, in Latin America, or elswhere? If there are markets in distant areas for your products there



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is hardly any sound reason why they should not be open to you.

We may therefore assume that the exchange of goods and services between the United States and the rest of the world is mutually beneficial for the same reason as is trade between Pittsburgh and St. Louis or between the United States and our neighbor to the north.

About a year ago the Department of Commerce published a report entitled "The United States in the World Economy." This publication has attracted considerable attention both within the United States and in foreign countries, not because it reflects any new discoveries or any new shortcut methods for guiding the conduct of the foreign trader. It merely focuses special attention upon the experience of this country in the field of international trade and finance during the period from the close of the first world war to the beginning of the present conflict. Many of the lessons which we can learn from the history of this experience relate to well-known economic doctrine, but by presenting them in concrete terms we can understand more fully how we can profit in the future by our past experiences. For example, anyone familiar with the mechanism of international exchange knows that international trade in its broader sense—that is, trade which includes all types of international commercial transactions—is a two-way affair; that in the final analysis imports finance exports; and that any ill-advised methods of moving domestic products into foreign markets will eventually bring about dislocations the ultimate consequence of which is a shrinkage in the total flow of international trade. There is nothing academic or theoretical about this, since in this study we have experience and not an economist's textbook as a guide.

In profiting by the lessons of past experience we need to view international trade in terms of benefits in which each nation may share. One nation's exports are another nation's imports. Sound economic conditions must prevail at each end if restrictive bottlenecks are not to develop. The general principles which have been accepted as a basis for achieving a post-war economy which is to be free from such bottlenecks are set forth in Article 7 of the so-called Master Lend-Lease Agreements, the first of which was signed by the United States and Great Britain in February, 1942. This Article p vided that in the final determinati of benefits exchanged under t Lend-Lease Agreements, the ter and conditions should be such as to burden commerce between t two countries but to promote "n tually advantageous economic re tions between them and the furth ance of world-wide economic re tions." The text amplifies this pr ciple by stressing the necessity expanding, by both international a domestic measures, employment well as the production, exchange a consumption of goods. These prin ples recognize the fact that a sta and peaceful world assumes maintenance of a high level of p duction, a maximum level of empl ment, and a correspondingly h volume of international trade. other words, the world commun cannot long remain highly prosper in some areas if economically stable and depressed in others.

I want to emphasize that this d not necessarily imply uniform sta ards of living throughout a worl which habits of living, customs, tra tions, and climatic conditions v widely. We need not talk in ter of a millenium in order to recogn the fundamentals of this all-imp tant problem. We do know, h ever, that whenever a people forced into a sharp downward cha in existing standards the cumula forces of instability breed a de to find a way out. Frequently methods employed tend to bec highly explosive and therefore ductive of disturbances elsewher

(Mr. Taylor will offer some fur thoughts on this subject in our A issue.)

Ships and Planes

The whole question of Amer steamship lines participating overseas aviation was recently subject of thorough investigation the Merchant Marine Committe the House of Representatives. Committee unanimously appro the idea of the unified service being in the public interest.

Admiral Emory S. Land, chair of the War Shipping Admini tion, also gave his strong end ment to the proposal in a pr statement, in which he declared already 26 foreign-flag carriers received approval from their go ments to engage in overseas transportation.

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The Gyro-Compass

Part IV. Corrections for Speed and Latitude.

Correction for Latitude

The latitude correction is necessary because of the eccentric connections employed to damp the oscillations of the compass. The correction is made by means of latitude adjustment scale, no special knowledge of the problem being required in order to make the correction. A complete explanation of the reasons for the latitude error, however, will be welcomed by the student because it involves a general discussion of compass behavior and will give the student an opportunity to find out some of the whys and wherefores that might otherwise escape attention.

At the equator, where only the horizontal component of the earth's rotation affects the gyro, the axle of the compass is horizontal and parallel to the earth's axis. At the equator, therefore, as soon as the compass has settled on the meridian, the ballistic will be at rest and the compass may be considered as a true gyroscope.

If we move the compass to a point to the north or south of the equator, however, it will be affected by the vertical as well as the horizontal component of the earth's rotation. At a point north of the equator, for instance, the north end of the gyro axle tends to turn toward the east and rise, as the earth rotates out from beneath it. This was illustrated in Fig. 14. It is apparent that the north end of the gyro axle must be precessed continuously in a westerly direction toward the meridian as fast as it is being displaced by the vertical component of the earth's rotation. The force necessary to do this is obtained automatically by the simultaneous tilt of the mercury ballistic which permits an accumulation of mercury in the lower or south containers so as to precess the axle continuously toward the meridian.

If it were not for the offset connection of the mercury ballistic, the gyro axle would eventually settle, theoretically, exactly on the meridian, with the end away from the equator tilted up just enough so that there would be sufficient excess mercury in the containers toward the equator to precess the gyro toward the meridian at the same rate as it is being carried away by the vertical component of the earth's rotation.

In order to damp the oscillation, however, the mercury ballistic connection is offset to the east of the centerline of the compass. This produces a counterclockwise torque about the vertical axis, causing the north end of the axle to precess continuously **down**. The axle, therefore, settles to the east of the meridian (in north latitudes) at a point where the downward precession of the axle due to torque about the vertical axis is exactly balanced by the horizontal component of the earth's rotation tending to tilt the north end up.

As we move the compass further north, the north end of the gyro axle turns to the east faster and rises faster, and for this reason the compass must be precessed faster toward the meridian. The downward pressure on the south end of the axle is correspondingly greater, the torque about the vertical axis is greater, the north end precesses down faster, and the gyro consequently settles further to the east.

South of the equator the effect of the earth's rotation on the gyro is just the opposite; here the **south** end of the axle tends to rise and turn to the east; the excess mercury is in the north containers, precessing the north end to the east toward the meridian. Torque about the vertical axis is reversed, so that the south end is being precessed down at the same rate as the horizontal component of the earth's rotation is tilting it up. Therefore the north end of the axle lies slightly to the **west** of the meridian.

The small angle at which the gyro axle settles from the meridian varies with the latitude, and for this reason a correction must be introduced which will compensate for this natural error at any latitude where the compass may be expected to be used.

From zero at the equator, this error increases to 2.9 degrees at 60 degrees north or south latitude; it is easterly in north latitudes and westerly in south latitudes.

No attempt is made in the gyrocompass to compel the axle to seek a resting place at variance with its natural settling position. Instead, a latitude adjustment is provided which moves the lubber ring the necessary amount to cause the compass indication to be true. Since the transmitter is mounted on the lubber ring, a correctional movement applied to the lubber ring also transmits the corrected reading to the repeater compasses, course recorder and gyropilot for automatic steering. This is the "Latitude Correction," and is made independently of the speed and course correction, described below.

Correction for Ship's Speed and Course

It has been shown that the relatively slow angular movement of the

earth's rotation (only one revolution in 24 hours) provides the motive force for the north-seeking precessional movement of the compass. When a vessel is traveling over the earth's surface, however, and therefore about the earth's center, the vessel's movement is compounded with that of the earth. If the direction of travel is east or west, the vessel's motion only adds to or subtracts from the earth's motion, and the effect on the indication of the compass is negligible.

When the vessel is traveling north or south, however, the effect is a maximum because the ship's speed produces a resultant which is not parallel to the plane of the earth's rotation. The effect on compass indication is proportional to the ship's speed and course, and is explained as follows:

In Fig. 16 (Case 1) the line AB represents the movement of a vessel steaming due north for a given period of time. Line AC represents the movement of the earth in the same period of time. The actual path taken by the vessel relative to the earth's rotation is AD. AC is the normal plane of rotation. AD is the actual plane of rotation due to combined movement of earth and ship. As far as the gyro-compass is concerned, therefore, a new meridian EF is produced which is at right angles to the line AD. At higher latitudes the movement of the earth is relatively smaller, the new, apparent meridian is displaced farther from the actual meridian, and a larger correction is required. Thus the amount of the correction is dependent upon the latitude of the ship. (Case 2 of Fig. 16.)

The displacement of the gyro axle is to the west for northerly courses and to the east for southerly courses, and the angular difference between the actual meridian and this new apparent meridian depends upon:

(1) The ship's speed.
(2) The ship's course, as it is only the northerly or southerly components of the course which are to be taken into account.
(3) The latitude, as the higher the latitude the smaller the earth's surface speed and therefore the greater the effect of the ship's speed.

The compass is provided with a corrector mechanism which automatically applies the correction due to course and speed at any given latitude by moving the lubber line the required amount to compensate for this error. The compass indicates the ship's true heading on all courses, and no corrections have to be applied by reference to tables.

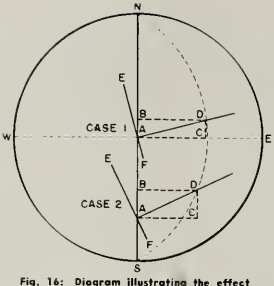


Fig. 16: Diagram illustrating the effect of ship's speed and latitude on the gyro-compass.

Speed Corrector

The speed corrector (Fig. 17), the function of which has been explained fully, is mounted on the spider frame. The corrector is fitted with an arm carrying a roller which operates in a "course cosine" cam groove in the under side of the azimuth gear. An adjusting knob on the top of the corrector causes a latitude scale to move over a plate engraved with speed curves. The knob is adjusted until point is reached where the latitude marked on the scale intersects t curve corresponding to the ship speed. Thereafter, corrections for courses are introduced automatica in accordance with the cosine of t heading by means of the cosine ca and the mechanical linkage in t corrector. The eccentricity of t cosine cam is such that the moveme of the lubber ring is zero for easter or westerly courses (where no co rection is required) and a maximu for northerly or southerly cours (where maximum correction is r quired). The mechanical linkage so arranged that no correction is troduced unless a definite latitude set to a definite speed. As the adju ing knob is turned to move the la tude scale from the top of the pla down across the speed curves, ho ever, the linkage begins to take effe and the lubber ring is displaced, p vided that the vessel is on other th an easterly or westerly heading. F example, suppose the ship is headi east and turns to north. If the sc were set to zero, no correction wou be introduced, even though the eff of the cam could be a maximum, b cause the position of the mechani linkage would nullify its action. the scale were set to maximum spe and latitude, however, a maxim movement of the lubber ring wo

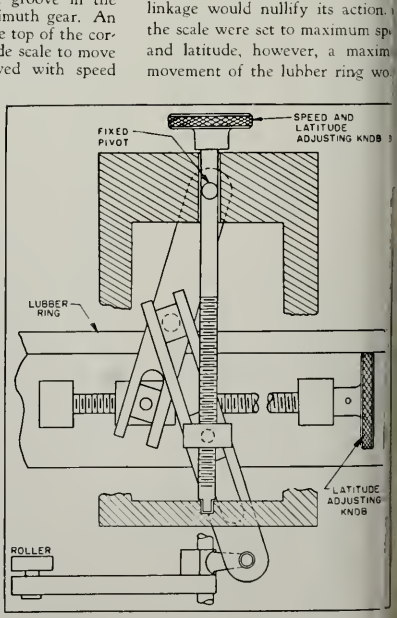


Fig. 17: Speed and latitude corrector mechanism.

obtained, because then the linkage would be set to the position of its rst effective leverage. Any intermediate setting produces proportionar correction.

Latitude Corrector

A latitude corrector, fitted with adting knob and scale, is mounted the lubber ring as shown in Fig. 1. By means of this corrector the lber ring may be shifted one way the other a few degrees to correct the natural latitude error desibed heretofore. The latitude corr tor, which functions independentbof the speed corrector, introduces t required latitude correction irrestive of the ship's speed or course.

The speed corrector and the latitle corrector are used as follows: When the ship is at sea, true indicatns for any heading at any latitude a, obtained by setting the speed and l tude correctors to correspond to tl ship's speed and latitude. When tl ship is at the dock or at anchor, tte indications for all headings and a all latitudes are obtained by setg the latitude corrector to correspnd to the latitude. The scope of correctors is from zero to 70 dees latitude and for speeds up to 30 ots. Correct compass indications a thus be obtained over all the igable waters of the globe at all the speeds normally associated h merchant vessels.

Transmitter

The transmitter, for electrically nsmitting the indications of the ster compass to the repeaters, is ven by the large azimuth gear on phantom element. The transmitis attached to the lubber ring, and refore the corrected compass ding is furnished automatically the repeater compasses.

Azimuth Motor

The azimuth motor, which furhes the power to keep the phantom ment in exact alignment with the sitive element, is mountd on the der frame and geared to the large muth gear on the phantom elent. It is a reversible, shunt motor, ntrolled through an amplifier panel the signal from the pick-up transmer on the phantom ring. When the azimuth motor operates to correct for any misalignment of rings, the inertia of the phantom element carries it beyond the center of alignment, initiating a signal opposite to that which started the system in motion. Therefore the azimuth motor is reversed, the reversal being continuous so that the phantom element never is completely at rest, but hunts or oscillates rapidly back and forth through an arc of about two tenths of a degree. The oscillation of the phantom element reduces the effect of friction about the vertical axis to a minimum. Oscillation is absent in the repeaters, a lost-motion device in the transmitter preventing it from being transmitted to the repeater cards.

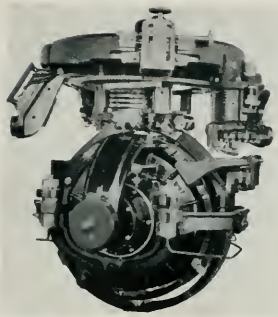


Fig. 18: Master compass, south view.

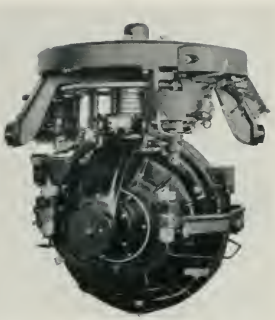


Fig. 19: Master compass, north view.

Non-Hunting Compass: Because of recent improvements in follow-up amplifiers, it is no longer necessary to introduce oscillation or "hunt" about the vertical axis. Consequently, on the latest Mk. XIV compasses, which have the redesigned amplifiers, there is no visible hunt. The result is a smoother transmission to the repeaters and elimination of all lost motion.

The master compass, exclusive of the binnacle, is shown in Figs. 18 and 19.

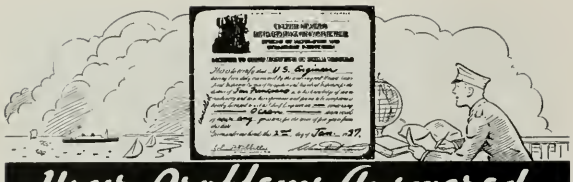
Binnacle

The binnacle supports and provides a protective housing for the master compass. The compass is suspended in the binnacle within a gimbal system so that it will hang vertically regardless of the ship's motion. The gimbal system is supported in the binnacle on flexible springs to prevent the vibration of the ship from being transmitted to the compass. The glass top cover and the doors in the sides of the binnacle may be opened or removed entirely to expose all parts of the compass for oiling, cleaning or inspection. Ordinarily the compass binnacle is kept closed and locked, as shown in Fig. 20.

All illustrations by courtesy of Sperry Gyroscope Company, Brooklyn, N. Y.

Fig. 20: Master compass binnacle.





Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Pressure and Fluid Flow

In the February issue the Bernoulli Principle was discussed. It was shown that in any fluid flow to increase velocity lowered pressure and to lower pressure increased velocity. This applies to either liquids or gases, whether compressible or incompressible.

Figure 1 illustrates fluid flow (in this case water) in a pipe. An orifice is installed at a flange coupling. The water approaching the orifice is at 37½ inches pressure. Small sampling water columns are installed at regular close intervals along the length of the pipe to show the pressure at the respective positions. Just ahead of the orifice there is a slight build-up of pressure, then a sharp drop to about four inches pressure just following the orifice. At this point the velocity is highest. A mercury U tube is shown connected across the orifice to measure this pressure differential. Then the pressure recovers as the velocity reduces to the same value as before the orifice. The final pressure is 32 inches, showing a loss of 5½ inches overall. But for this slight loss, there is made available a differential pressure on the measuring device of 33½ inches, great enough to operate indicating and recording meters.

Furthermore, this pressure difference is closely proportional to the flow in gallons or cubic feet per second. For compressible fluids the ratio of rate of flow to pressure differential is not directly proportional but is consistent, and meters can be calibrated to read accurately at all rates of flow.

Figure 2 shows the installation of such an orifice for metering steam flow. Both an orifice plate and a flow nozzle are shown. The differential pressure take-off is indicated at the bottom. The dimensions shown are the lengths needed in the system before any elbows or change in the pipe are made. It is necessary to permit the velocity to be fully reduced to a non-turbulent, streamlined flow without interference from changes in cross sections to prevent interference in the ratio of flow rate to pressure differential.

If desirable, the overall pressure loss can be reduced by a more streamlined throat design, as in the venturi throat, discussed in the previous article. This is frequently the case in water metering. But in steam flow the pressure loss is not troublesome and it does not mean an energy loss because the loss is converted to heat energy increasing the superheat or drying the wet steam slightly. The loss is due to eddies and the turbulence in and following the nozzle.

If wet steam or superheated steam is being measured, different calibrations are needed for a given pipe diameter and throat diameter, and calibration corrections must be made for the degree of superheat or per cent of water in the steam.

Figure 3 illustrates an installation to measure steam flow, wherein the pressure differential is transmitted to the U tube, manometer, or flow meter via two water columns. In order to cancel out the height of the water column and its effect on the meter the up-stream and down-stream column must have the same water level in them. This is done by condensing them full of water by a radiator shown in the figure. Changes in differential pressure do not cau a very great change in displacemer in the water in the columns, so th the loss by such displacement quickly made up by condensation.

Bernoulli's Principle is used al in vacuum equipment. Figure 4 show a typical jet vacuum pump. Tw stages are shown with cold conde sate water admitted at a point follow ing the first stage. This condens the steam from the jet, greatly redu ing the volume of vapor and air be moved by the second and la stage. The nozzle, Part 3, in t figure, is the expanding throat ty and it must not be considered t throat of the pump. The high veloci and therefore low-pressure area at the discharge end of this nozz The pressure is reduced to such low value that steam and air fro the condenser are sucked in to t region. The contracting and expan ing throat, Part 2 in the figure, designed to maintain this velocit therefore reducing area as jet stea is partly condensed, until the air well mixed with the jet. Then t combined or mixture velocity is r duced in the expanding thro Similar reasoning applies to stea jet, Part 11, and expanding thro Part 10, in the second stage.

Boiler feed pumps have been o erated on this principle. The fe water of the railroad locomotive nearly always pumped into the boi by a steam jet. It may seem stran that steam at 250 lbs. in the jet c pick up water at atmospheric pr sure and force it back into the boi at this same pressure. At first glar it appears to be like a steam boi feed pump with the steam and wa cylinders of the same diameter. T obviously would not work. The ste cylinder must have a greater dia eter than the water end to have greater force to overcome fricti and losses. The jet feed pump, li wise, would not operate if a wa jet were used. But the steam jet h more velocity than that correspo ing to pressure alone. It has a la velocity due to the heat content the steam. Thus a great deal m heat energy is released in the than is represented by the work forcing the feedwater into the bo against boiler pressure and fricti

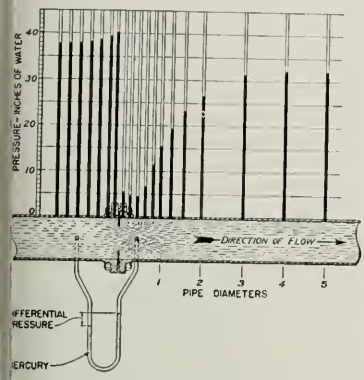
Still another application of B noulli's Principle is illustrated in l 5. This indicates (a) a ship stea ing along a narrow channel of wa such as a canal or river. If the s

should be closer to one bank than the other, such as at A in the figure, there would be an increase in the relative water velocity on the port side as compared with the starboard side. This increase in velocity means a slight reduction in pressure and a slight lowering of the water level at that near side, as at A. This of course causes the ship to be pushed over even closer to the bank. Pilots are therefore very careful about getting too close to a bank or shoal because of this strange sucking action which seems to pull them too close. To make matters worse, the rudder is put to the right to steer away from the left bank, but this pushes the stern even closer to the shore line, increasing velocity and the pressure difference. The ship seems to respond to the rudder very quickly when close to a shore line and under way.

The same effect is noticed when two ships steer close together and are under way. When they get as close as perhaps a ship's beam or closer, they are drawn together by powerful forces and they cannot steer clear of each other. Such a situation can only be cleared by one ship stopping to get away from the other.

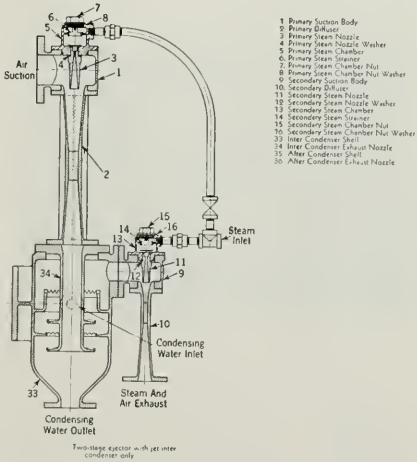
The forces causing them to pull together are due to Bernoulli's Principle acting in the water as well as in the wind. Both are increased in velocity in the space between them with the corresponding reduction in pressure. Experienced deck officers will never allow their ship to get close to anything when there is much "way" on the ship.

There are a great many other interesting applications of these principles. The steam whistle, wind musical instruments, the waving flag in the breeze, the pole, mast, or yard arm vibrating in the wind, are all illustrations.

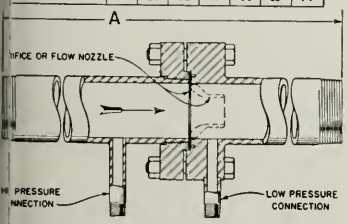


Illustrating the differential pressure created by fluid flow through an orifice.

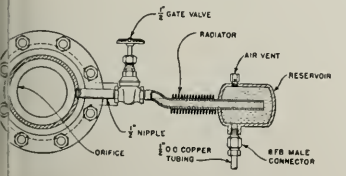
At the left, top to bottom, are Figs. 1, 2 and 3. Fig 4 is at top right, and Fig. 5 at bottom right.



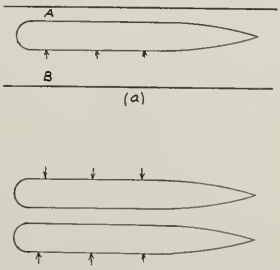
SIZE OF PIPE—INCHES	1	1½	2	2½	3	3½	4
LENGTH A—INCHES	19	29	38	47	56	65	74



Orifice or Flow Nozzle Pipe.



Cross Section through radiator-reservoir connected to a steam line.



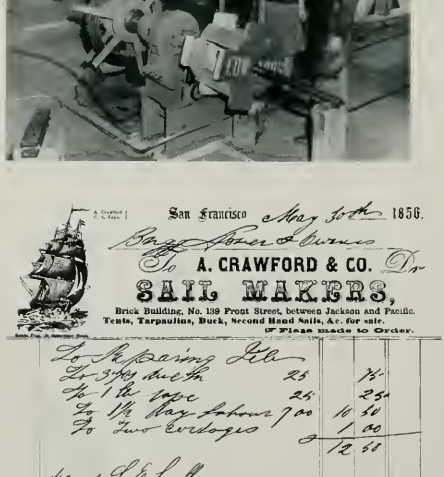
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San Francisco May 5th 1856.

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Approved E C Lovell

Crawford & Co

Facsimile of parent company's bill.

"Leading the Convoy" is a slogan that could well describe the Weeks-Home - Emerson Company's new Wire Rope Department and Rigging Loft. This old-established firm has gradually forged ahead in the wire rope business, and two years ago moved its main store and office from Market Street to more modern quarters at 255 Mission Street, San Francisco. Until recently the 24 Mission Street quarters housed the Wire Rope Department, but increased business necessitated its removal to more spacious quarters now located at 515 Folsom Street, San Francisco.

This new Wire Rope Department covers an area of 10,000 square feet and is well equipped with the most modern facilities for winding, splicing and socket work. This department ships out many cargo falls, bridles, slings and cut lengths of wire rope to many of the steamship companies and industrial plants engaged in war work in the Bay area. All work is done by the most experienced splicers and wire rope men and is ably supervised by Ernie Vogel, who was formerly with the Edwards Wire Rope Company for nine years.

The Weeks-Howe-Emerson Co. 5 years ago succeeded the old firm of A. Crawford & Co., ship chandlers who were in business at 137 Front Street, between Jackson and Pacific, in 1856. At that time they were charging 25c per pound for Manila rope, and had a trade to Tahiti; they also were large importers of Irish flax felt, a business which is still carried on by the present company.

The offices of the key men are as follows: Felton W. Howe, treasurer and general manager; S. F. Weeks, president; C. K. Howe, vice president; J. J. Imhof, manager; J. O. Isenhardt, personnel manager; M. Silva, assistant manager; A. J. Creo, manager Net and Twine Department; A. Smitha, office manager; Ernie Vogel, manager Wire Rope Department; R. L. Dineley, manager Los Angeles office.

The company's Los Angeles office is now located at 412 West 6th

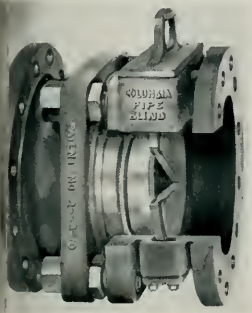
Keep Posted!

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

The Columbia Pipe Blind

A new type of pipe blind has recently been placed on the market by the Columbia Machine Works of Berkeley, California. This pipe blind (which is patented) has already been tested out in practical operation and is believed to be the most effective answer to the many troubles and dangers which attend blanking off on pipe lines and safety in carrying of mixed cargoes.

It is well known that all modern oil tankers carry various grades of liquid cargoes, and as valves cannot be relied upon to guard against the possibility of contamination by leakage from one tank to the other, it becomes necessary to place "blanks" in connecting pipe lines.



This operation as a rule is a task that is expensive, dirty and dangerous. Expensive, because of the time and men required to perform the work. Dirty, because when a pipe line is opened for the purpose of inserting or changing a pipe blind, all the oil or liquid which is in the pipe line and cannot be drained out will run on the deck or tank top or on the pump room floor. Dangerous, because when oil or gasoline is thus liberated from the pipe there are always escaping gases in attendance which may become the cause of an accident involving loss of both life and property.

To avert all these attendant objections this new pipe blind has been developed. The accompanying cut will show at a glance how the objectionable features mentioned above are overcome with it.

The advantages claimed for this fitting are:

(1) The unit is self-contained and all dimensions conform to those of gate valves of corresponding sizes and pressures. Thus a gate valve may be removed from any pipe line and a Columbia Pipe Blind installed in its place.

(2) After the pipe blind has been installed the operation of changing it from open to closed or vice versa consists of:
  (a) Slacking up on four nuts.
  (b) Screwing back the lock nuts to liberate the gate.
  (c) Removing one gate and installing the other.
  (d) Slacking back the lock nuts.
  (e) Tightening the clamping nuts.
  (f) Tightening the lock nuts.

(3) Regardless of the size of blind involved, the operation is completed by one man in five minutes.

(4) The gates are fitted with an umbrella which covers the opening to prevent dirt from falling in.

(5) A hand-hole plate is fitted at the bottom for removal of any foreign object which may lodge in the gate opening.

(6) This hand-hole plate is fitted with a pipe plug which may be removed for fitting a drain valve should this be desired.

(7) A neoprene ring is installed on the male member of the fitting to keep the pipe line tight while the gates are changed. Thus no oil can leak out of the pipe line during the period of changing gates unless there is a "head" on the pipe line before it is opened.

(8) The gaskets are fitted into dovetail grooves in the gates for easy renewal when required.

(9) For marine purposes, the blind is made of either cast steel or bronze.

(10) The studs are of stainless steel and nuts of bronze to prevent sparks.

It has been stated by present users that this is the only absolutely safe and practical fitting of its kind on the market, and a wide use in both marine and stationary fields is predicted.

A Tough Searchlight for Navy Signaling

Tough enough to stand the pounding of heavy waves and the shock of big guns fired close by, a signaling

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Intensity of searchlight beam being measured by Howard Wrigley, laboratory supervisor at Westinghouse Lighting Division.

searchlight developed by Westinghouse engineers is now ready for duty aboard Uncle Sam's warships.

Already in production at the Westinghouse Lighting Division in Cleveland, the searchlight will enable Navy vessels to "talk" to other ships, to airplanes and to shore patrols. It will play its most useful role as a "stand-in" for radio communication when such signals might be picked up by the enemy or are ineffective because of weather conditions.

The searchlight flashes its message in code by projecting a beam of light through a series of Venetian-blind shutters that are opened and closed by hand to simulate dots and dashes. On a clear night the beam is visible for many miles.

This searchlight will take a terrific beating on the open deck of a warship. In battle it must stand up under the recoil of giant guns fired nearby. When the ship is plowing through heavy seas, the searchlight must be able to take the heavy battering and be ready to light at any time.

A special heat-resisting glass, ten times stronger than plate glass, enables the searchlight to resist sudden changes in temperature.

Hendy Power Plants Ordered for Soviet

Thirty large turbo-generator units for the devastated power plants, factories and cities of the Soviet Union have been ordered from the Joshua Hendy Iron Works of Sunnyvale, Calif., it is announced by Charles E. Moore, president of the company.

Preliminary work is already under way on the sets, of which 10 will deliver 2000 kilowatts each and the remainder 500 kilowatts each. The power plants, it is understood, will be used as package units to supply electricity in ravaged areas recaptured by the Russians from the retreating Germans.

These turbines are of a design developed by Hendy for installation as industrial or electric generating plants, and will be marketed by the company as one of its post-war products. Mr. Moore also revealed that Hendy is submitting bids to several foreign countries for the manufacture of a variety of industrial power equipment.

The Mac-way Gangway And Platform

The George M. Philpott Co. 1160 Bryant Street, San Francisco are now manufacturing and marketing a lightweight structural all-steel gangway and an attached swivel platform with quick operating safety locking device.

The gangway—now being used on tugboats, Libertys, Victorys, C-1's and C-2's—is manufactured in sizes from 16 feet to 40 feet. It is about half the weight of a similar size wooden gangway, is easily handled and may be had with walkaway of expanded metal or hardwood strippers.

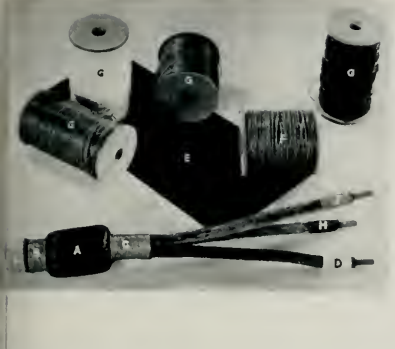
The all-metal swivel type gangway platform can be fitted to any type of vessel, is of rugged construction, and has a safety steel tread with an adjustable turntable. The distinctive feature of this platform is the quick operating safety locking device, which enables the seaman to attach the gangway to the platform and have the whole assembly ready for use in about 10 minutes; the time usually occupied in this operation is one hour or more.

The company have pioneered in the manufacture of expanded metal gangways, and the attached platforms, on the Pacific Coast.





Above, right: The Mac-way platform. Right: The Mac-way gangway.



Navy cable end-sealing demonstration unit, showing materials used in construction. The crotch is filled in with moisture-proof insulating compound. Over this compound, a specially treated strip of Fiberglas tape, E, is wrapped at A. Specially treated cord, F, is then served on at B and C, working toward center of tape. Compound under stretch-proof tape is forced into the crotch of cable and out toward the ends of conductors, at D, H and J. Insulating sheaths are then tied down with specially treated cords, G. These are available in different colors for circuit identification.

oisture Seal for ipboard Cables

Navy electrical design engineers, rking with Owens-Corning Fiber-s Corporation, have developed a thod of sealing against moisture por and water penetration the en ends of cables carrying current al to the operation of fighting ships l their armaments.

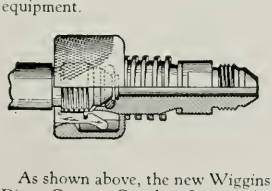
The vulnerable point has always en the end of the cable where the le armor has been removed to per- separation of the conductors for ok-up. This open end is enclosed a moisture-tight terminal box, but the box is shattered by bombing shell fire there is always the possi-ty that water entering the open le end will work down into the le, causing a short circuit.

Materials required for sealing the le, independent of the terminal s, are a non-moisture-absorbent x with a fairly constant viscosity ge, Fiberglas tape impregnated h a synthetic rubber compound, l treated Fiberglas tying cord. erglas tape and tying cord are em-yed primarily because of their h tensile strength and because y will not stretch or absorb mois-e.

Since the glass tape and cord are non-inflammable, this modifica-n of the end of the cable does not stroy its flame resistant character-cs. The first step is to skin back cable armor a short additional dis-ce from the end, further exposing interior conductors. The filling x is then built up around the con-ctors, at the crotch. The conduc-s are pulled together and tightly apped as a unit, with strips of Fiberglas tape four to six inches wide. The Fiberglas cord is served on from both ends toward the middle of the wax section. Thus pressure forces the wax back into the core of the cable, forming a solid vapor-and-moisture proof seal.

New Wiggins Test Coupling

The E. B. Wiggins Oil Tool Co., Inc., of Los Angeles announces development of an amazing new "direct-connect" coupling, specially adapted for use in testing operations. It affords countless applications to manufacturers of carburetors, aircraft, automobiles, refrigeration and air conditioning equipment, metering gauges and valves, testing and hydraulic equipment.



As shown above, the new Wiggins Direct-Connect Coupling fits over the end of any standard nipple, the "dogs" of the coupling gripping securely in the undercut just behind the threads on the nipple. The coupling is equipped with a seal which has withstood pressures up to 3,000 lbs. Because of the simplicity and speed with which the new Wiggins coupling can be hooked up, users have already reported as much as 50 per cent savings in manhours and labor.

Since standard nipples are available with or without the undercut, the latter may be installed when reordering so that the Wiggins Direct-Connect Coupling can be used for all testing operations. The new coupling comes in sizes of 1/4, 5/16, 3/8, 1/2, 5/8 and 3/4 inches.

The Wiggins Company has already begun volume production to meet the demands of a wide variety of industries. Further information on this new Direct-Connect coupling may be secured by writing the E. B. Wiggins Oil Tool Co., Inc., 3424 East Olympic Blvd., Los Angeles 23, California.

"Lignablock"

Lignum Vitae, the "Wood of Life," so called because of its supposed medicinal, curative powers, was taken back to Europe from the Americas in the 16th century. This was over 100 years before the sailing of the "Mayflower" carrying our Pilgrim Fathers to Plymouth Rock. Little did the physicians and apothecaries then think that today, 400 years later, Lignum Vitae would be so vital to seafaring ships.

Lignum Vitae is the hardest wood known, weighing twice as much as oak. Approximately 30 per cent of its volume is in natural resin, which renders the wood self-lubricating and especially adaptable for use under water.

Lignum Vitae is used principally in the great naval vessels of the world for stern bushings, lining stern tubes of propeller shafts, pulleys and rigging gear. There is no substitute for it.

Davis Hardwood Company, San Francisco, carries, in addition to the Lignum Vitae logs, a complete stock of "Lignablock" (Lignum Vitae sawn blocks). The blocks are boxed heart timbers, coated with clear shellac, and are stocked in three bracket sizes: 5" and up by 5" and up, by 24" and longer in length; 7" and up by 7" and up, by 24" and longer in length; and 10" and up by 10" and up by 24" and longer in length. The grade of the blocks is in accordance with the U. S. Navy Department Specifications 39L2d, type "B-Block."

"Lignablock" is proving very satisfactory. It eliminates considerable waste. There is saving in transportation costs and labor. Blocks furnished in this form reduce waste in the elimination of sap and irregularities in the log, and save operations in the manufacture of Lignum Vitae bearings for ships.

Status of American Shipbuilding Industry

By J. Lewis Luckenbach

83d Meeting, A.B.S.

At the 83rd annual meeting of the American Bureau of Shipping, held on February 6, 1945, at New York, J. Lewis Luckenbach was elected president for the thirteenth time, and other officers were re-elected as follows: David Arnott, vice president-chief surveyor; Joseph W. Powell and William D. Winter, honorary vice presidents; Jerome B. Crowley, treasurer; John W. Cantillion, secretary and assistant treasurer; and Kenneth D. Hull, assistant treasurer.

Among those elected to the Board of Managers were two well-known Pacific Coast men, Fraser A. Bailey of the Matson Navigation Company and Joseph A. Moore of the Moore Dry Dock Company.

Prominent among the new members was the name of W. M. Laughton, general manager Pacific Coast yards of the Bethlehem Steel Company, Ltd., Shipbuilding Division.

As usual, President Luckenbach delivered some very pertinent remarks on the present state of shipbuilding in the United States. This article, together with the table herewith, gives a comprehensive idea of his thesis.—(Ed.)



In vessels of 2000 gross tons and upward, the 38 major shipyards engaged in such production delivered an average of four vessels every day during 1944, for a total of 1463 ships aggregating a measurement of 11,403,163 gross tons and a total dw capacity of 16,143,065 tons. By the end of 1945 the total of the fleet built by the U.S. Maritime Commission in American shipyards will have reached the astounding total of 5209 units, with an aggregate of approximately 39,876,606 gross tons or 57,442,165 tons total dw capacity. In September, 1939, there existed in the world's merchant marines a total fleet of 9278 merchant vessels of 52,700,000 gross tons, and 72,800,000 dw tons. Twenty-seven p cent of these ships were then ov 20 years old. It is estimated th the new American fleet, considerir speed and other operational factor will practically equal the capacity cargo handling of the entire pr war world fleets.

In the new U.S. fleet, by the e of 1945 there will be approximate 1000 tankers with a total dw capa ity of approximately 13,000,000 ton These vessels average a 25 per ce increase in speed over pre-war tan ers, and will therefore have appro imately the same capacity as t total pre-war world tanker fleet.

A great record was made in t installation of 7,448,950 shp of ma propulsion machinery. This is, believe, a world's record for any o year.

As in 1942 and 1943, Pacific Co shipyards completed the greate number and tonnage of mercha vessels, finishing 576 with a gr tonnage of 4,579,689 tons. Atlan Coast yards delivered 572 ships 4,554,601 gross tons, while on t Gulf 287 vessels of 2,162,333 gr tons were turned out. Great Lak yards finished, in addition to num ous smaller vessels, 24 merchant shi of 106,540 gross tons. For the th successive year the State of C fornia led the country in produci merchant vessels, turning out 4 vessels, or almost one-third of t total completed in the United Stat The State of Maryland was seco with 145 vessels. In addition to m chant ship construction, Americ shipyards produced 39,971 na

TYPE AND TONNAGE OF MERCHANT VESSELS COMPLETED BY AMERICAN SHIPYARDS IN 1944
SELF-PROPELLED, STEEL, 2,000 GROSS TONS AND OVER

Type	Number	Gross Tons	Deadweight Tons	Total Horsepower	Horsepower Turbine	Horsepower Turbo-Electric	Horsepower Reciprocating	Horsepower Diesel
Liberty—Cargo	722	5,199,537	7,079,113	1,805,000	—	—	1,805,000	—
Victory, AP2, Cargo	30	228,210	319,646	198,000	198,000	—	—	—
Victory, AP3, Cargo	74	563,154	790,764	691,900	691,900	—	—	—
Victory, AP5, Transport	105	798,577	1,045,694	981,750	981,750	—	—	—
C-3 Cargo and Transport	27	213,626	329,050	252,450	252,450	—	—	—
C-3 Cargo, Export Type	5	33,625	38,130	44,000	44,000	—	—	—
C-2 Cargo	103	780,503	1,006,285	679,800	679,800	—	—	—
C-2 Cargo, Waterman Type	7	43,155	74,634	46,200	46,200	—	—	—
C1-A Cargo, Diesel Drive	17	95,413	122,578	70,550	—	—	—	70,550
C1-A Cargo, Turbine Drive	6	30,744	44,058	26,400	26,400	—	—	—
C1-B Cargo	18	120,798	157,777	79,200	79,200	—	—	—
C1-M-AV1 Cargo	36	136,980	138,240	61,200	—	—	—	61,200
R1-M-AV1, Refrigerated Cargo	3	11,376	10,950	5,100	—	—	—	5,100
P2 Transport	8	140,611	79,016	155,000	93,500	61,500	—	—
C4 Transport	26	299,286	203,039	257,400	257,400	—	—	—
C1-S-AY1 Transport	6	42,480	14,957	26,400	26,400	—	—	—
S4 Transport	20	120,000	60,000	132,000	—	132,000	—	—
S4 Cargo Transport	10	60,590	27,975	66,000	—	66,000	—	—
Tanker T2-SE-A1	189	1,952,149	3,123,555	1,368,360	—	1,368,360	—	—
Tanker T2-SE-A2	32	340,231	525,134	320,000	—	320,000	—	—
Tanker T3-S2-A1	7	85,085	128,170	106,400	106,400	—	—	—
Tanker T3-S-BZ1	1	14,225	22,000	13,200	13,200	—	—	—
Tanker T3-S-BF1	3	33,048	54,960	28,050	28,050	—	—	—
Tanker T3-S-A1	3	29,799	48,644	23,100	23,100	—	—	—
Tanker, Liberty Type	5	36,099	52,615	12,500	—	—	12,500	—
Totals	1463	11,409,202	16,026,994	7,449,960	3,547,750	1,947,860	1,817,500	136,850

Prepared By American Bureau of Shipping

combat and auxiliary units for the U.S. Navy and hundreds of small vessels for the Army, the Coast Guard, and the Defense Plant Corporation.

A very significant feature of this naval program is the tremendous use of the diesel engine as a propelling unit. At the end of 1944 U.S. Navy had in operation 32,000,000 hp in diesel engines, which is seven times the total propulsion power in all types of propulsion machinery in the pre-war American merchant fleet.

The comparatively small figure of 13,850 hp in diesel propulsion units for seagoing merchant vessels is the largest ever installed in the United States in any one year.

In spite of many difficultics, not the least of which were the necessity for training most of the shipyard personnel and the varied modifications required to fit standard designs to specialized war requirements, the rate of production of ships has kept pace with the urgent need on a scale hitherto considered fantastic. The acute shortage of trained personnel and its relation to the national problem of man power requirements during such emergencies constitutes an important lesson and seems to have been impressed in the minds of all our people. However, it is vitally necessary to see that the facts are remembered during peace times; that is, that continued training and employment be stressed so that we can maintain a sufficient merchant marine to guarantee our national security and defense if a similar occasion should again arise.

While there has been a marked simplification of design details because of the use of welding and a considerable progress in shipbuilding methods through an extended use of fabrication methods, the fact that so many ships were built of the same design in different types might prompt the wrong conclusion regarding developments in naval architecture.

Much experimental and research work has been done, and until this is brought out into the light after the war it would be difficult to predict what we might expect. However, it is safe to say that substantial strides will be made both in material and construction which will be beneficial to the design, navigation and operation of ships.

Progress may also be expected in cooperation with other nationals in the studies emanating under the auspices of the Coast Guard on the rules governing safety of life at sea, admeasurement and other maritime problems in order that our ideas and regulations and those of foreign nationals be coordinated.

The Maritime Commission started out with what seemed to be an ambitious program. The war augmented this program literally hundreds of times. The Commission called for the complete cooperation of the shipbuilding industry, and many facilities hitherto unthought of for use in maritime production were utilized, all of which added up and made possible the accomplishment of the preponderous task with which they were confronted.

Shipbuilding has arisen from a minor industry to second place. The tremendous demand for ships of all types has been perhaps better and more promptly met than any other requirement for this war, and the shipbuilding industry and our merchant marine have a right to point with pride to the fact that when the demand was made for the tools with which to win the war, they were not found wanting.

On the Ways—

SHIPS IN THE MAKING



Veterans of three major European invasions, these LC I's arrive home after an Atlantic crossing. Manned by the U.S. Coast Guard, they are powered by engines manufactured by the Detroit Diesel Engine Division of General Motors.

(Photo approved by the Navy Department.)

Fast Ore Carriers With High-Pressure Steam

The four ore carriers now under construction at the Sparrows Point yard of Bethlehem Steel Company are for the South American trade and are of special interest from several aspects. Known as the C-5 type, they are of 18,000 dwc. and of 580 ft. length, with greater beam and depth than the largest Great Lakes ore carriers. Their reported speed will be at least 15 knots, and probably more, as their geared turbines will exceed 10,000 shp.

Engineers and naval architects will watch the trials and service operation of these ships with interest as the steam pressure and temperature will be the highest yet installed in an American flag vessel. A fuel consumption of 0.50 lb. of bunker-C oil is expected.

Premium Reduction on War Risk Life Insurance

Reduction of premium charges on Individual War Risk Life Insurance covering the lives of seamen from one dollar per $1000 to fifty cents a $1000 for each month of coverage, regardless of the voyage involved, was announced by the War Shipping Administration February 6.

The new rate, effective March 1945, will apply to all new li written as well as renewals and v continue in force until further not

More Ships for the Navy

No fewer than 500,000 tons additional ships are to be built the U.S. Navy, in addition to 3,586,000 tons already planned the 1945 program, if Congress propriates the necessary funds. T new and supplementary program v bring the 1945 total to 4,086,0 tons, compared with 5,419,000 a 29,777 vessels in 1944. Authorizati already has been received by t Navy for this new construction, a it only awaits the actual cash a propriation.

Only 206 combatant ships are cluded in the 1945 program, co pared with 415 in 1944, so the m jority of new craft will be auxiliari including landing boats; but t combatant ships may average larg than last year. Presumably, a co siderable proportion of the new ve sels will be built on the Pacific Coa unless repairs to existing ships ta up most of the yard facilities.

Consolidated Steel in Ship Repair

Consolidated Steel Corporati enters the ship repair and conversi business with the allocation to Wilmington yard by the Navy a the Maritime Commission of a ne 14,000 ton sectional steel floating dr dock, according to an announceme by the corporation. Work on t dock installation will start imm diately and will be completed June, 1945.

Consolidated recently was awar ed contracts by the Navy, Arr and War Shipping Administrati for ship repair work in the Los A geles Harbor area. For the past fi months construction of a new do side repair yard on Terminal Isla has been under way. Ship rep operations have already begun at t site.

Presently the Wilmington yard building Navy transports and coas cargo vessels and will commer construction immediately of standard long-range Maritime Co mission C-2 cargo and passen vessels. These ships will be w suited for post-war shipping. Coas cargo ships are being built at Co solidated's Long Beach yard.



A memorial plaque dedicated to the tanker SS Lost Hills is put in place aboard the ship by Ruth Meyer, shipyard worker at Marinship. All five young men come from the community of Lost Hills, Kern County, California, after which the tanker is named.

Lost Hills Memorial

a living, fighting memorial to five
s from Lost Hills, Kern County,
ne tanker SS Lost Hills, now at
on war-vital assignments. A
norial plaque has been placed
ard the ship, containing names
pictures of the five young men
m Lost Hills who have been killed,
n prisoner or reported missing
he war.

orming a permanent part of the
, wherever she may sail during
coming years, are the pictures of
nard Earl Pitzer, missing in the
diterranean, September 11, 1943;
Alden Sergent, prisoner of Jap-
e, December, 1941; George W.
hens, killed in Italy, August 23,
4; George Henry Woolley, killed
inian, July 29, 1944; and Harold
Rose, killed at Saipan, June 24,
4.

he Lost Hills was launched at
inship in Sausalito on August
1944, and delivered into service
September 26. She is the third
series of 41 tankers comprising
Hills class being built at Marin-
for the U.S. Maritime Com-
ion.

ne Pacific Coast Launchings m Jan. 15 to Feb. 15

fornia Shipbuilding Corporation, Vilmington, California

Cedar Rapids Victory, January 5
Monroe Victory, January 24
Alhambra Victory, January 31
Rutgers Victory, February 2
Colby Victory, February 13

mercial Iron Works, Portland, regon

5 (L) 100, January 27
5 (L) 101, January 27
LCS (L) 102, February 3
LCS (L) 103, February 3

Consolidated Steel Corporation, Ltd., Wilmington, California

USS Garrard (CT), January 13
USS Gasconade (CT), January 23
USS Geneva (CT), January 31
USS Niagara, February 10
MSS Sheepshank, February 10

Consolidated Steel Corporation, Ltd., Long Beach, California

MS Square Knot (AV-1), January 13
MS Snug Hitch (AV-1), January 27

Hubbard's South Coast Co., Newport Beach, California

YP-640, Cargo Vessel, January 15
C-60316, 45-foot Picket Boat (U. S. Navy), February 10

Kaiser Company, Inc., Yard 3, Richmond, California

USS General Andre W. Brewtser, January 21

Kaiser Cargo, Inc., Yard 4, Richmond, California

USS Caledonia, January 20
USS Fairfield, February 5

Marinship Corporation, Sausalito, California

Midway Hills, Tanker, January 14
Whittier Hills, Tanker, Janary 20
Potrero Hills, Tanker, January 20
Sunset Hills, Tanker, January 22
Signal Hills, Tanker, January 30
Ventura Hills, Tanker, February 8

Moore Dry Dock Company, Oakland, California

SS Lookout (C-2), February 11

North American Shipbuilding Corporation, Newport Beach, Calif.

Fish Boat #11, 62′ Tuna Boat, February 1
Fish Boat #12, 54′ Purse Seiner, February 7

Permanente Metals Corporation, Yard One, Richmond, California

SS Logan Victory, January 16
SS Clearwater Victory, January 20
SS Anniston Victory, January 26
SS Moline Victory, January 31
SS Medina Victory, February 10

Permanente Metals Corporation, Yard Two, Richmond, California

SS Lahaina Victory, January 17
SS Gretna Victory, January 20
SS Laredo Victory, January 22
SS Harvard Victory, January 27
SS Yale Victory, January 31
SS Middlebury Victory, February 3
SS De Pauw Victory, February 7
SS Bucknell Victory, February 10
SS Grinnell Victory, February 14

Todd Shipyards Corporation, San Pedro, California

USS Everglades, destroyer tender, January 30



More and more shipyards on the Pacific Coast are converting to repair yards and Everett Pacific Shipbuilding and Dry Dock Company of Everett, Washington, is among those to convert. Here we see the R. C. Stoner "pride of Standard Oil Company of California," one of the largest and finest tankers afloat, undergoing inspection in dry dock.





(At left) The Brantley M. Eubanks of Piedmont were honored guests at launching of tanker Ventura Hills at Marinship on February 8, when Mrs. Eubanks christened the ship. Mr. Eubanks is secretary and director of the Sausalito shipyard while Mrs. Eubanks is sister of Kenneth K. Bechtel of Del Mesa, president of Marinship.
(Above) The massive shape of a great, grey tanker is silhouetted in the lights of the Sausalito shipyard on San Francisco Bay.

●

PMR received this knock-down and drag-'em-out sketch from Merrill J. Gigy, consulting chief engineer at the Lake Washington shipyard, Houghton, Wash., It depicts what happens between the plate jugglers on the one hand and the plumbers and duct doctors on the other. The challenge was hurled when it was learned that the Piping Dept. had twice as many plans to finish as the Hull Dept., but had double the personnel for the job. The plans of both groups must be turned in to the Navy by a certain deadline. The winners get a free picnic lunch.

And The Battle Is On—



Educated Victories

California Shipbuilding Corpo
tion yard on Terminal Island, Ca
fornia, began this week pouring c
a fleet of Maritime Commission V
tory Ships which will bear the nam
of American universities and c
leges.

The names have been assigned
the Ship Naming Committee of t
Maritime Commission at Washin
ton, D. C.

The first of the new series of shi
is the S. S. Rutgers Victory, launch
February 2. Mrs. Manuel Quezo
widow of the former president of t
Philippines Commonwealth, chr
tened the ship. Miss Maria Aurc
Quezon, her daughter, was maid
honor. Also present at the launc
ing were several distinguished Ru
gers alumni.

The following ships named f
American schools and showing t
dates of their organization, are unc
construction or projected at the C
ship yard:

Rutgers University, New Brun
wick, N. J., 1766.

Dickinson, Carlisle, Pa., 1773.

Colby, Waterville, Me., 1820.

Rensselaer Polytechnic Institu
Troy, N. Y., 1824.

Maryville, Maryville, Tenn., 18

Norwich University, Northfie
Vt., 1819.

Amherst, Amherst, Mass., 182

Tufts, Medford, Mass., 1852.

Baylor University, Waco, Tex
1845.

Santa Clara University, San
Clara, Calif., 1851.

Beaver, Jenkintown, Pa., 1853.

Lehigh University, Bethlehem, I
1865.

Wheaton, Wheaton, Ill., 1860.

e Barge and 120 Ships—
nth's Total

Merchant shipyards delivered 120 els aggregating 1,229,296 dead- ght tons and one large derrick ge during January, 1945, accord- to the U. S. Maritime Commis-

eadweight tonnage delivered n Maritime Commission ship- ls in January, 1945, was 1.6 per higher than that delivered in ıary, 1944, and 22 per cent above in January, 1943. A comparison ne "light ship" displacement built ınuary, 1945, with January of the previous year shows an increase 9 per cent over 1943 and of 5.8 cent over 1944. Increase of aver- d.w. tonnage indicates a greater duction of merchant types with er military types being turned

f the 120 ships delivered in Jan- , 90 were merchant types for chant service, eight were mer- nt ships delivered for military ac- nt, and 22 were built as military s for use of the Navy and one derrick barge.

West Coast shipyards built 51 ves- of 521,815 d.w. tons or 42.5 per of the tonnage delivered in Jan- . The derrick barge having no d.w. was built on the West Coast.



Codet-Midshipmon Wil- lian Watterson of Berke- ley, who participated in the launching of the SS Berkeley at Kaiser Yard No. 1, December 21, has been assigned to duty aboard the ship named after his home city. At right, Mrs. Fitch Robertson, spon- sor of the vessel and wife of the Mayor of Berkeley.
Upon the completion of six months tour of sea duty aboard the Victory ship, Cadet Midshipman Watterson will be as- signed to U. S. Mer- chant Marine Academy, Kings Point, New York, for completion of his studies in the U.S. Mer- chant Marine Cadet Corps and commission- ing in the Merchant Marine Reserve, USN.

Shipyard	Type	Number
Alabama Shipbuilding Co., Mobile, Ala.	T2 Tankers	5
Bethlehem-Alameda, Alameda, Cal.	Military Type	2
Bethlehem-Fairfield, Baltimare, Md.	Victary Cargo	6
Bethlehem-Sparrows Point, Md.	Military Type	1
	Private Tanker	1
Colship, Wilmington, Cal.	Military Type	5
	Victory Cargo	7
Consolidoted Steel Corp., Wilmington, Cal.	Military Type	2
	Coostol Cargo	2
Delta, New Orleans, La.	Libertys	4
East Coost, Bayonne, N. J.	Navol Tankers, Coastal	2
Federol, Kearny, N. J.	Military Type	2
Froemming Bros., Inc., Milwaukee, Wis.	Coastal Cargo	1
General Finance; (Office) Chicago, Ill.	Derrick Barge	1
Gulf, Mobile, Ala.	C2 Cargo	1
Ingalls, Pascagoula, Miss.	C3 Cargo	1
J. A. Jones, Brunswick, Ga.	Libertys	4
J. A. Jones, Panama City, Fla.	Libertys	4
Kaiser Corga, Richmand No. 4, Richmond, Cal.	Coostol Cargo	1
Kaiser Co., Richmond No. 3, Richmond, Cal.	Military Type	1
Kaiser Co., Swan Island, Portland, Ore.	T2 Tankers	5
Kaiser Co., Voncouver, Wash.	Military Type	1
Leothem D. Smith, Sturgeon Bay, Wis.	Coostal Cargo	2
Morinship, Sausolito, Cal.	T2 Tankers	3
Moore Dry Dock Co., Oakland, Cal.	C2 Cargo	1
North Carolino, Wilmington, N. C.	Military Type	3
New England, Sa. Portland, Me.	Libertys	4
Oregon Ship, Portland, Ore.	Victory Cargo	7
Pennsylvonia Shipyards, Beaumont, Tex.	Refrigerated Coastal Cargo	3
Permonente Metals Corp., Richmond, Cal.	Victory Cargo	13
Pusey & Jones, Wilmington, Del.	C1 Cargo	1
St. Johns River, Jacksonville, Flo.	Libertys	4
Southeostern, Savannah, Ga.	Libertys	5
Sun Shipbuilding, Chester, Pa.	T2 Tankers	5
Todd-Houston, Houston, Tex.	Libertys	7
Walsh-Kaiser, Providence, R. I.	Military Types	3
Western Pipe & Steel, San Francisco, Cal.	C3 Cargo	1

The Alfred E. Smith Takes New York Sidewalk to Sea

A piece of the "sidewalks of New York" went to sea January 17 as part of the wheelhouse deck when the Liberty ship Alfred E. Smith was launched at the yard of the Todd-affiliated New England Ship- building Co., So. Portland, Me.

The 10,500-ton ship, named in honor of the former New York Governor, who died October 4, 1944, was sent down the ways into the waters of Casco Bay as Mrs. John A. Warner, Mr. Smith's daughter, smashed the traditional bottle of champagne against the bow.

Governor Thomas E. Dewey of New York sent a special memorial message for the occasion in which he expressed hopes of "many happy landfalls" for the ship. The message will be embodied in a plaque to be placed in the wheelhouse.

After the launching the official party went to the outfitting pier to take part in the ceremony of placing the sidewalk flagstone in front of the binnacle, where the man at the wheel always will stand on a part of the "sidewalks of New York" the late Mr. Smith loved so well.

MARINE DEPARTMENT
AETNA INSURANCE CO.
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DIESEL-ELECTRIC ICE BREAKERS

(Continued from page 145)

offers hydraulic engineers a problem. Moving 240 tons of water from port to starboard and back again in three minutes is a task of unusual proportions aboard ship. To accomplish this, water is carried in large inverted tear-shaped port and starboard tanks formed by an inner bulkhead and the skin of the breaker. The heeling action is started by pumping water to one side of the vessel through 24-inch pipe lines then automatically reversing the action to pump it to the other side. Resulting ship action is a slow traverse roll that can be regulated to list the ship from 10 to 15 degrees. Three 60-hp Westinghouse electric motors drive three Fairbanks-Morse centrifugal pumps capable of handling 15,500 gallons of water per minutes at 5 feet head. The ships can also be rocked fore and aft—"trimming"—by similar electric-centrifugal pumping equipment.

This forced heeling of the vessel is for the purpose of keeping the ship from becoming frozen solid into thick ice. Marine engineers explain that once a breaker is wedged in ice the friction of the hull of the breaker against the ice tends to hold it fast. If the hull is kept moving at all times, preventing the necessity of overcoming starting friction, normal ice breaking operations can be continued.

Steering Control

Largely because of the rigorous demands made on the ship during ice breaking operations, a completely automatic electric rudder control has been installed. Known as a Westinghouse Rototrol, this rudder control electrically balances two rheostats, one in the pilot house and one in the steering compartment. A second remote control can be operated from the crow's nest. The helmsman's movement of the steering wheel changes the resistance of the rheostat in the pilot house and sets up an unbalance with the rheostat in the steering compartment, thereby allowing current from a motor-generator set to flow to one of a pair of variable voltage 50-hp Westinghouse motors that are geared to the rudder quadrant. The motor operates until balance is restored, which point is reached when the rudder is at the position indicated by the movement of the wheel in the pilot house.

TODD SENDS 17,791 SHIPS TO WAR

(Continued from page 148)

Todd Houston Shipbuilding Corporation	83
Todd Galveston Dry Docks Inc.	1032
Todd-Johnson Dry Docks, Inc.	1381
New England Shipbuilding Corporation	100
New Jersey Shipbuilding Corporation	190
Total	7046

Outstanding among the achievements of the corporation in 1944 was the production of escort airplane carriers at the Tacoma division of Todd Pacific Shipyards Inc. This yard completed on schedule a program of building 49 of the CVE's—"baby flat-tops"—and began a new program of construction of larger type carriers, CVE 105's, which will keep the plant busy until well into 1946.

The men and women workers at the Seattle yard were officially commended by Read Admiral E. L. Cochrane, USN, Chief of the Bureau of Ships, for "a shipbuilding achievement of which you may be justly proud."



MARINE HYDRAULIC CONTROLS

(Continued from page 152)

simultaneously controllable from the flying bridge, the wheel house, or the engineer's panel. Total absence of any tendency for the controls to creep resulted in outstanding power plant performance. This was particularly the case in relation to steady engine control permitting the boats readily to maintain formation despite heavy seas. Outstanding fuel economy for optimum power output resulted from close adjustment of the supercharger manifold pressure made possible by accurate control. Adjustments were unaffected by vibration or by temperatures up to 103 degrees in the engine room, 10 degrees above zero inside the flying bridge, and 50 degrees in the pilot house.

Tests of System

To prove the system, test units were subjected to 100,000 cycles of operation at 30 cycles per minute—the remote unit moving a load of 175 inch pounds. None of the mechanical parts indicated excessive wear after completion of the tests. A life expectancy for pressure seals made of synthetic material was indicated as being in excess of 50,000 cycles. These results were regarded as being entirely satisfactory for a highly dependable product.

Extensive research experiments conducted in relation to many combinations and ideas indicated the wisdom of employing a continuous fluid circuit, i.e., the use of a return line to conduct the fluid energy from one cylinder to another. The series circuit makes possible the transmission of equal loads in either direction without lag. Service results have proved the continuous circuit arrangement to be superior to any tried or considered.

ISOdraulic systems are manufactured by the Adel Precision Products Corporation, Burbank, California.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

At right: Lieutenant Frank F. Piersan, Jr., U. S. Naval Hospital, Camp Shoemaker, Calif., talks with one of the machinists at the Atlas Imperial Diesel Engine Company plant, Oakland, California.

Below: Left to right: S. G. Palmer, dean of engineering, University of Nevada; G. F. Twist, vice pres. and gen. mgr. of Atlas plant; and A. B. Damanaske, executive head of mechanical engineering, Stanford University, inspecting finished engine parts at Atlas plant.



Below: Among those studying Enterprise gear assembly are left to right: B. D. Moses, University of California at Davis; J. R. Van Dyke, University of Nevada; Peter Kyrapoulus, California Institute of Technology; S. G. Palmer, University of Nevada; J. J. Barich, Enterprise Engine and Foundry Company, San Francisco; and Harvey T. Hill, DEMA.





D.E.M.A. Meets At San Francisco

***Subject*—EDUCATIONAL COMMITTEE CONFERS WITH EDUCATORS**

At the invitation of the educational committee of the Diesel Engine Manufacturers' Association the deans, professors and representatives of approximately 14 colleges and universities in the west gathered at 9:00 A.M., February 8, at the offices of Enterprise Engine & Foundry Company, San Francisco, California.

An organized tour through the plant, showing assembly and test of Enterprise engines was the first order of business. This was followed by a short discussion by various members of the Enterprise organization: E. B. Scott, sales manager, on present and anticipated uses of Enterprise engines; Serge Kovaleff, production manager, on opportunities for students and professors for summer work; Roy Hundley, chief engineer, on type of student most suited for diesel engine manufacturers. Following the short discussions, a movie on the construction of an Enterprise engine was shown. Then the group adjourned to the St. Francis Hotel,



A good point from one of the educators attending the meeting of the D.E.M.A. in San Francisco gets a hand from the head table. Left to right: W. Johnson, Joshua Hendy Iron Works; R. M. Murray, Fairbanks - Morse Co.; Harvey T. Hill, manager D.E.M.A., Chicago; F. H. Kilberry, president of Atlas Imperial Diesel Engine Co. and vice president of D.E.M.A.; and Prof. Robert B. Rice, University of North Carolina.

where a luncheon and meeting was held in the Green Room.

The meeting was conducted by F. H. Kilberry, president of Atlas Imperial Diesel Engine Company, Oakland, California.

At the conclusion of the meeting the group adjourned to Oakland for a plant visit through Atlas Imperial Diesel Engine Company.

The discussions and speeches brought out the fact that over 90 per cent of diesel engine manufacturing capacity west of Chicago is centered in the San Francisco Bay Area. Harvey T. Hill, manager of D.E.M.A., summed up the present diesel use in America as follows:

"The use of diesel engine power has increased 100 per cent in the past ten years. Our Navy, for instance, has now more diesel power than steam power. Added to this is the use of diesel power for all types of marine transportation, railroad transportation, truck transportation, in stationary power plants, factories, in the lumber, petroleum and construction industries, and in agriculture.

"The need for men to engineer diesel engine construction, to service the engines and operate them is greater than the supply. This applies particularly to men who have a thorough engineering training in diesels. This is both a challenge and an opportunity. Our educators see it in the same light and have welcomed the suggestion of the Diesel Engine Manufacturers' Association to cooperate in training men for this field. The industry has pledged its help to aid these schools in securing proper equipment and information on diesel engines to supplement the basic principles of mechanical engineering which they are teaching at the present time. The schools, in turn, have agreed to cooperate by placing diesel engineering, servicing and operation on the same high level as any other engineering skill."



Professor Robert B. Rice, director of Diesel Engineering at North Carolina State College, enthusiastically explains certain diesel principles to this interested group. Left to right: Prof. Rice; Roy Hundley, chief engineer, Enterprise, of San Francisco; Ande Davis, Wall Street Journal; A. P. Domanoske, exec. head of Mechanical Engineering, Stanford University; Prof. R. Marthinelli, College of Mechanical Engineering, University of California.

Among those in attendance were: Peter Kyropoulos, Instructor in M.E., California Institute of Technology, a representative from Long Beach City College; G. L. Sullivan, Dean of Engineering, Santa Clara University; A. P. Domonoske, Exec. Head of M.E., Stanford University; Dean M. P. O'Brien, Asst. Dean E. Howe, Prof. R. Marthinelli, Prof. H. A. Johnson, University of California; L. M. K. Boelter, Associate Dean of Engineering, University of California, Los Angeles; Prof. Duncan, University of So. California; S. G. Palmer, Dean of Engineering, J. R. Van Dyke, Head of M. E., University of Nevada; W. H. Paul, Professor of Auto Engineering, Oregon State College; Lt. Frank F. Pierson, Jr., Ed. Services Officer, U. S. Naval Hospital; Lt. Cmdr. B. B. Cole, Washington State College.

The Diesel Engine Manufacturers and representatives were: E. W. Winter and F. V. Billig, American Locomotive Company: F. H. Kilberry and P. Twist, Atlas Imperial Diesel Engine Co.; F. R. Kohnstomm, Baldwin Locomotive Company; J. C. McKissick, Cooper-Bessemer Engine Co.; Saul Behlove, Gerald Brusher, Neil Heard, Roy Hundley, Serge Kovaleff, E. B. Scott, J. J. Barich, Enterprise Engine & Foundry Co.: R. M. Murray, Howard Oxsen, P. S. Proctor, Fairbanks-Morse Company; H. M. Peterson, General Machinery Company; Wm. C. Colyer, Ingersoll-Rand Company; E. E. Baker, T. D. de Bruyn, J. M. Fowle, W. Johnson, C. G. Patch, R. J. Smith, Joshua Hendy Iron Works; Roy F. Anderson, Lorimer Diesel Engine Co.; G. H. Lienhord, Norberg Manufacturing Co.; O. H. Fischer, F. W. Newell, Union Diesel Engine Co.; H. R. Marthens, J. P. McArthur, J. R. Rankin, Worthington Pump & Machinery Co.

Harvey T. Hill and Professor Robert B. Rice of the D.E.M.A. staff were present as were various members of the press and diesel publications.



James Kell (second from left), boilermaker for Hurley Marine Works, ship repair yard at Oakland, approves of script for air show for his firm's employees. Left to right, Ray Lewis, narrator; Kell; Gilbert Thomas, radio writer and producer; Gordon Willis, KQW staff announcer.



Fit as a fiddle and "looking like a m Admiral Howard L. Vickery was welcome at his desk on the morning of March 2.

Two Tug Boat Captains Awarded Bronze Star

Two tubgoat captains of the American Merchant Marine have been awarded the Bronze Star by the Navy "for meritorious service and courageous devotion to duty" during the Normandy invasion, the War Shipping Administration announced recently.

They are Capt. F. J. Hughes of Baltimore, Md., master of the oversize WSA tug Gay Head; and Capt. D. W. Hayman, of Norfolk, Va., master of the same type tug Trinidad Head.

These tugs were assigned the task of towing vital military and naval equipment to the assault areas on the coast of France. By expert seamanship and navigational skill, and in spite of cross winds and rough seas, they accomplished their difficult tasks. The citations say, "Their steadfast courage in the face of enemy artillery fire, heavily mined waters and sporadic air attack was inspiration to their crews."

Pearch Gets Gavel

Captain Walter G. Pearch, marine superintendent, American President Lines, has been awarded a gold inlaid and inscribed gavel by the Waterfront Employers' Association of California in recognition of outstanding services performed during the year 1944, as general chairman of the San Francisco Bay District Accident Prevention Committee.

The gavel was presented by Mr. Foise, president of the Waterfront Employers' Association at a brief ceremony at the Association's office in the Financial Building.

Of Men and Ships

A brilliant radio show for a Pacific Coast ship repair yard went on the air just before the New Year. Titled "Of Men and Ships," the show airs for Hurley Marine Works, Oakland, California, every Saturday, 10:15-10:30 p.m. over KQW, Columbia station.

Each program is dedicated to one shipbuilding craft. Purposes: to increase morale of workers; and to boost merchant marine recruitment.

WOAMM HAS AS GUESTS PROPELLER OFFICIALS



Propeller officers of the Port of San Francisco were the guests of the Women's Organization for the American Merchant Marine on February 13. During the meeting Joseph A. Moore, Jr. (standing) greeted the Women's group "with a few words" of praise. Amused by his remarks in the picture are WOAMM President, Mrs. Earle H. Carder, Eugene Hoffman, secretary of Propeller Club, Mrs. Poul Cronk and Captain Blackstone.

Maritime Personalities That Are News



At left: Angus T. Minnis receives check for $100, for his "Speed Up The War" suggestion, from Lieut. Comdr. W. C. Peet, Jr., Pacific Coast Director, W S A. The idea was for a specially constructed table for assembling vessel inventories.

Below: Henry R. Satphen, exec. vice pres. of Electric Boat Co. and "father" of our Navy's PT boats, receives autograph from Dr. Wassell, beloved missionary war hero, after the latter's fighting speech to Elco workers.





Thomas J. Bannon of Seattle, newly elected president of Western Gear Works plants at Seattle, Los Angeles and Lynwood and of Pacific Gear & Tool Works of San Francisco. He is also president of Webster-Brinkley Company and Hallidie Machinery Company of Seattle.

•

Mrs. Carl W. Flesher, sponsor of a tiny "craft".



Thomas J. Bannan New Western Gear President

Thomas J. Bannan of Seattle has been elected to the presidency of Western Gear Works, a Washington corporation with plants in Seattle, Lynwood and Los Angeles, California, and also of its associate plant, the Pacific Gear and Tool Works of San Francisco. The election was held recently in San Francisco.

Mr. Bannan, who has been executive vice president of the companies for a number of years, succeeds his father, P. L. Bannan, Sr., whose death occurred last October. The related companies, with a history of fifty years in the industry and with four plants on the Pacific Coast, are among the largest of their kind in the nation. Products of the associate plants are used in every basic industry in the west and since Pearl Harbor, are to be found in practically every phase of the operation of the Army and Navy. Mr. Bannan, in addition to his almost 25 years of service in the Pacific and Western Gear companies, is also connected with other well-known companies. He is president of the Webster-Brinkley Company and the Hallidie Machinery Company of Seattle and is on the board of the Pacific National Bank of Seattle.

Other officers elected include Berchman A. Bannan of Los Angeles, vice president; Philip L. Bannan, Jr., of Los Angeles, treasurer; and Charles F. Bannan of Seattle, secretary.

First "Craft" Launched From Flesher Yard

A tiny "craft" with fine lines and a net displacement of seven pounds eight ounces was successfully launched from the maternity ways of the Peralta Hospital, Oakland. Its overall length is 21 inch, beam 8 inches, and its fuel capacity is normal.

Home port of the "craft" will be the Carl W. Flesher home, the Regillus Apartments.

Mrs. Flesher is reported fine and the father is as well as can be expected.

The name selected is Carl William, Jr., and christening ceremonies are to be held in the near future. This is the first "craft" launched in the Flesher domicile, but hospital attendants state it was the most important event in the life of the Pacific Coast Director of the Maritime Commission, who has supervised the building of more than 2000 vessels in West Coast shipyards.



Ceremonies at Armed Guard Center, Pacific, San Francisco, California on January 4, 1945, for presentation of Port Director's Cup to SS Monterey. Left to right: Lt. (jg) E. L. McConnell, USNR; Lt. Comdr. T. Macklin, Executive Officer, Armed Guard Center, Pacific; Capt. E. R. Johanson, Master, SS Monterey; Capt. W. F. Lafrenz, Asst. PD, 12 ND; Lt. J. A. Weber, CO AG Unit, SS Monterey; Comdr. R. J. McKenzie, USMS, Chief Officer; Lt. (jg) W. G. Mitchell, Communications Officer, USNR.

Port Director's Cup to SS Monterey

The ceremonial bridge at the Armed Guard Center, Pacific, Treasure Island, San Francisco, recently was the scene of the presentation of the Port Director's Cup to the naval armed guard unit aboard the SS Monterey, owned and operated by the Matson Navigation Company and which has served as a chartered troop transport since the beginning of the war.

The cup was presented by Captain Walter F. Lafrenz, USN (Ret.), assistant port director of the 12th Naval District. It was accepted by Lieutenant John R. Weber, USNR, commanding officer of the Monterey's armed guard unit. Lieutenant Weber was formerly athletic coach at the Delano High School, Delano, California.

The cup has been awarded to seventeen vessels since it was donated in 1942 by Commander Alvin L. Weymouth, USNR, port director's office. The Armed Guard Center retains the cup and a silver plaque is presented to the ships winning the award, which is based on a point system for proficiency in gunnery, condition of battery, smartness of personnel and condition of quarters.

Captain E. R. Johanson, master of the Monterey, who represented the ship's personnel at the ceremony, recently was awarded the Merchant Marine Distinguished Service Medal by the U. S. Maritime Commission for distinguished service in action with the enemy in connection with rescue operations in the Mediterranean.

Speer Becomes Carswell Marine Vice President

J. S. Carswell, president, Carswell Marine Associates, Inc., has announced that Jas. W. Speer has been elected vice president of that organization. The company maintains offices at 1 Exchange Place, Jersey City, N. J., 15 Park Row, New York City, and at 417 Market Street, San Francisco.

Mr. Speer, who resides in Easton, Md., has been affiliated with Mr. Carswell's group of companies for the past three years. For almost 30 years he has been active in industrial and marine engineering. He was with Wellman Engineering Company from 1915 to 1924, where he was mainly concerned with handling bulk cargoes, large marine cranes and other shore and ship equipment. From 1924 to 1932 he was with Westinghouse.

In his capacity as vice president of Carswell Marine Associates, Mr. Speer shares the direction of American Ventilating Hose Co., Catskill Metal Works, Inc., Colvin-Slocum Boats, Inc., Gifford-Wood Co., Lake Shore Engineering Co., The Landley Company, Inc., Ulster Foundry Corp., and for Pacific Coast only the Lombard Governor Corp. Mr. Speer also has an active interest in the Cargocaire Corp., which is closely related to the Carswell group.





In this group of pictures are some well-known United States Maritime Service officials. Extreme left: Commander Arthur O. Brady, new superintendent at Merchant Marine Cadet School at San Mateo. Right: Lieutenant R. D. Herron, new commandant at California Maritime Academy at Vallejo, California.

Below, left: USMS officials who officiated at the recent opening of the new USMS Upgrading School at Wilmington, California, included (left to right): Commander E. F. Jaeger, superintendent of Training Station at Catalina Island; Captain H. J. Tiedemann, Pacific District Operations Officer for the Maritime Service with headquarters at 1000 Geary St., San Francisco; and Chief Boatswain's Mates John R. Bundock, William R. Sienkawski, and J. W. Smith, officers in charge of the new school.

Below, right: Seated at his desk is Lieutenant Commander E. G. McDonald, new District Cadet-Midshipman Supervisor of the U. S. Merchant Marine Cadet Corps in San Francisco.





United States Maritime Service Activities

The opening of a United States Maritime Service Able-Bodied Seaman's Upgrading School at Wilmington, California, on January 9, was announced recently by **Captain H. J. Tiedemann,** USMS, Pacific District Operations Officer for the Maritime Service.

The opening of the Wilmington A.B. School now completes the Maritime Service Pacific Coast network of A.B. Schools, with schools now located at San Francisco, Seattle, Portland, and Wilmington.

On deck to dedicate the new school in Wilmington were West Coast Maritime Service officials, including Commander E. F. Jaeger, superintendent of the USMS Training Station at Catalina Island; Captain H. J. Tiedemann; and Chief Boatswain's Mates John R. Bundock and Wm. R. Sienkowski, officers in charge of the new Wilmington school.

In urging all merchant seamen to take advantage of the upgrading schools, Captain Edward Macauley, deputy administrator for the War Shipping Administration recently stated:

"It is the duty of every seaman to take advantage of these opportunities for self-improvement. Today, it is not only his patriotic duty, but a personal obligation he owes his family and himself."

Brady Heads Cadet School

Commander Arthur O. Brady, USNR, was recently named new superintendent of the U.S. Merchant Marine Cadet School at San Mateo, replacing **Commander R. M. Sheaf,** transferred to Naval duty.

Commander Brady was formerly stationed in San Francisco as District Cadet-Midshipman Supervisor. For the past year he has served as assistant supervisor of the U.S. Merchant Marine Cadet Corps in Washington, D.C. Prior to his recall to active duty in the Navy, Comdr. Brady served 23 years at sea as officer in the Merchant Marine. He was formerly with American-Hawaiian Lines, United States Lines and Panama Pacific Lines. The Commander's first sea experience was obtained at the age of 17 with the U.S. Coast & Geodetic Survey. In 1922 he was graduated from the Massachusetts Nautical Academy.

New Commandant of Midshipmen

The new Commandant of Midshipment at the California Maritime Academy at Vallejo is **Lieutenant R. D. Herron,** USNR. Captain Claude B. Mayo, USN, superintendent of the Academy has announced his ap-

pointment. Lieutenant Herron a resident of San Diego, comes to the Academy following duty on the staff of the Navy commander in the Mediterranean during which time he participated in the African, Sicily, Salerno and Southern France landings aboard the fleet flagship.

Prior to joining the Navy in 1942, Lieutenant Herron was with the marine division of Union Oil Company.

United States Maritime Service New Supervisor

Lt. Comdr. E. G. McDonald, USNR, has been appointed new District Cadet-Midshipman Supervisor for the U.S. Merchant Marine Cadet Corps in San Francisco.

Commander B. M. Dodson, USNR, former District Cadet-Midshipman Supervisor for San Francisco, has been transferred to Sidney, Australia as Foreign Supervisor.

Lt. Comdr. McDonald was formerly assistant to the commanding officer of the U.S. Merchant Marine Cadet Basic School, San Mateo, after aiding in establishing the local District Cadet-Midshipman Supervisor's office at 262 California Street. He returned to that office in November, 1943, as assistant to Commander Dodson.

After serving on transport vessels during the last war, Lt. Cmdr. McDonald served with the American President Lines as chief engineer on their luxury liners. He later joined the Matson Navigation Co. as assistant chief engineer on the Matsonia. He made several trips to the South Pacific carrying marines to battle areas and was later called to active duty with the U.S. Navy and assigned to the U.S. Merchant Marine Cadet Corps.

"Old Salt"

Veteran **Fred H. Young** has gone back to school. The 68 year old USMS officer, graduate of the Maritime Service Officers' School at Alameda, has reported back to the school following six months at sea and 15,000 miles of travels as chief engineer aboard a merchant vessel. The venerable merchant marine officer, Who is from San Francisco, plans to keep sailing from now 'til victory.

He was retired from the U.S. Coast Guard with the rank of Captain four years ago, but he decided the life of an armchair sailor was not for him. So forsaking his rank and armchair, he reported to the USMS Officer's School and became an officer candidate. He had not been book boning for over 20 years and found the competition tough against younger men, but he made the grade and went to sea following the course. And now, he's back for another crack at the books.

Ties Merchant Marine Record for Torpedoing

Torpedoed for the eighth time in the sinking of a Liberty ship off the Pacific Coast in November, **USMS Lieut. Peter Chelemedos** of San Francisco now ties the merchant marine record for torpedoings suffered by one man.

The sinking of the American Mail operated Liberty ship by the Japs was revealed by the Navy on January 19, 1945.

Sailing since the age of 16, 22-year-old Chelemedos is one of the youngest first mates in the Maritime Service. He received hi third mate's license at the U.S. Maritime Service Officers School, Alameda, California, in 1942. He raised his license after twice attending the USMS Upgrading School at 1000 Geary Street, San Francisco. Lieut. Chelemedos was aboard another American Mail vessel and Pacific bound 12 hours after being dropped in San Francisco by the rescue ship.



Lieutenant Peter Chelemedos of San Francisco

Cardox Official Visits West Coast

Eric Gertz, vice president of the Cardox Corporation, of Chicago, was a recent visitor to Cardox-Western, Inc., of Los Angeles.

COMMISSIONING OF USS ADMIRAL C. F. HUGHES AT BETHLEHEM



Commodore Philip F. Roach of the U. S. Coast Guard, commissioning officer, turned the vessel over to Captain John Trebes before an audience composed of the ship's officers and crew. (Left to right): Commander D. H. Bartlett, Lt. R. S. Lambert, Chaplain, Rear Admiral E. P. Jones, Captain John Trebes, and Commodore P. F. Roach.







Above: These two scenes are of a recent gathering of Propeller members at the Los Angeles-Long Beach Chapter when Walter H. Odemar and Commander Patterson were guests.

At left: Speakers' Table—Reverend J. Whitcomb Braugher, Jr., Chaolain of Propeller Club; Capt. Claude B. Mayo, superintendent of California Maritime Academy; Rear Admiral Ike Johnson, USN (Retired), Director of Naval Officer Procurement; Lee K. Vermille, Propeller Club president; Rear Admiral Albert W. Marshall, USN (Retired); Captain C. H. Want, USN.

Southern California Propeller Club Hears Odemar and Patterson

January meeting of the Propeller Club of the United States, Port of Los Angeles-Long Beach No. 66, packed to capacity the Tudor Room of the Pacific Beach Club in Long Beach on January 24 for the unusual program arranged by Leo Archer, Howard Woodruff, and Leonard Backus.

Walter H. Odemar, an officer of the Native Sons of the Golden West, through the courtesy of Joe Costello, made a thought-provoking address on the timely subject of "The Japanese Return to California."

Commander H. R. Patterson, USNR (Retired), who returned recently from an extensive tour of the Pacific, spoke most interestingly on "The Operation of Navy Special Construction Battalions."

An interesting motion picture in technicolor was screened, showing Stevedore Training. Members of the Propeller Club were asked to cooperate in the current recruiting drive for officers experienced in stevedoring and terminal work.

Roy Barto, Propeller Club member of Los Angeles, has been elected first vice president of the Foreign Trade Association of Southern California.

Arthur Sewall of the Todd Shipyards Corp., has been transferred to San Francisco.

Max G. Linder, president and general manager of the Transmarine Navigation Corp., Los Angeles, has been elected to the Board of Governors to fill the vacancy created by the recent death of Perry S. Newcomb.

Propellers Hear Talk By Grange Master

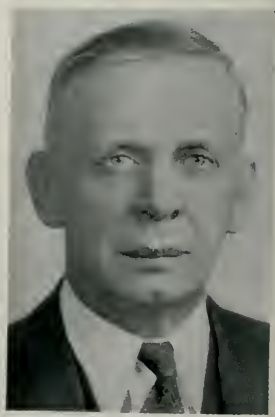
"Shipping's number one market," says George Sehlmeyer, "is the American farm."

Mr. Sehlmeyer, master, California State Grange, and former member of the State Harbor Commission, was the guest speaker at the San Francisco Propeller Club, February 21. He spoke eloquently on the rise and fall of shipping volume coincident with the rise and fall of the farm market. He said that the long-time prejudice of the farmer against the shipping industry, because it was subsidized when the farmer was not, has largely been dissipated because the farmer is subsidized too. They have learned that a subsidy is not necessarily profit. He quoted the U. S. Supreme Court that "where federal money goes, there goes federal regulations" too. He urged that closer relations and better understandings be developed between shipping and agriculture.

The meeting was the first one under the gavel of President Joseph A. Moore, Jr., and he introduced the new officers and committee chairmen to the members.

New Propeller Club Port for San Diego

Lee Vermille, president of the Los Angeles-Long Beach Port and national vice president of the Propeller Club of the United States, announces that a San Diego Port will be installed on March 13.



George Sehlmeyer, master Calif. State Grange.



A NEW KIND OF A SHIP CLINOMETER

Read it as easily as a compass—no guesswork —no calculations for overthrow — Always accurate

In port or on the high seas — in calm or heavy weather — you can tell, at a glance, the degree of list or roll of your ship. The John L. Chaney Ship Clinometer is a precision-built navigating instrument that gives you quick, positive information — without guesswork — without calculations for overthrow.

Placed anywhere on the ship — in the engine room, on the bridge, in the chart room, on the extreme port or starboard side — this Clinometer indicates list or roll with unerring accuracy.

The operation is silent and accurate — no overthrow — nothing to adjust or compute — nothing to get out of order — no bearings to oil, corrode, or wear out — guesswork is eliminated. Installation is simple, adjustments unnecessary. The U. S. Navy and U. S. Maritime Commission make wide use of John L. Chaney Ship Clinometers — they have proved their worth. The price is $12.50 each. At this low cost you can afford to have a Chaney Clinometer at a number of places throughout the ship. Order now. If not entirely satisfied after examination, return the Clinometer and your money will be promptly refunded.

★

Actual size of John L. Chaney clinometer — 12⅜" wide—6¼" deep — curved tube is 16" long and ⅝" in dia.

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Anchor Packing's new and modern quarters is a strictly marine branch at 524 North Avalon Blvd., Wilmington, California. The manager of this branch is A. C. "Duke" De Puydt, who has been "with Anchor" for 20 years!



TRADE NOTES

Davey Compressor Company of Kent, Ohio, has announced the appointment of The Major Equipment Company, 919 Woodlawn Avenue, Cambridge, Ohio, as a Davey distributor.

This firm is one of the leading road and industrial equipment sales organizations in Ohio, and it is adding the Davey line to round out and strengthen its sales and service facilities.

The new distributor will handle sales and service of Davey equipment in the southeastern counties of Ohio. The Davey line includes portable and stationary compressors, heavy-duty truck power take-offs and pneumatic saws.

Peabody Engineering Celebrates 25th Anniversary

January 29 was a gala occasion for the Peabody Engineering Corporation, New York City. That day marked the celebration of the 25th Anniversary of the founding of the Corporation and also the presentation of the United States Maritime Commission's Maritime "M" and the Victory Fleet Flag given by the Commission in recognition of outstanding production achievement.

Portable Products Acquires Tagliabue

The C. J. Tagliabue Mfg. Co., pioneers in the manufacture of industrial control and laboratory instruments, has sold its assets, including goodwill, name and patents, to the Portable Products Corporation of Pittsburgh, Pennsylvania.

The progressive research and development policies in electronic and mechanical instrumentation which for so many years have characterized the Tagliabue organization will be continued vigorously under the local management and personnel that has made TAG an outstanding in industry.

The business will be operated as a separate division of the Portable Products Corporation.

A Suez Smoke Screen...





A Compass...



and a Surprised Pilot

MIDWAY THROUGH the Suez Canal, a Liberty Ship found herself suddenly enveloped in a dense smoke screen which the English were using to hide some maneuvers.

Visibility was zero. The channel was too narrow for turning back—and besides, the Captain had a cargo labeled "*Urgently Needed.*"

Nothing to do but keep going. No way to do it except by the Sperry Mark 14 Gyro-Compass.

The Pilot steered his course through the narrow channel, depending entirely on the Gyro-Compass to avoid the sloping sides which he could not see. For more than an hour, the ship's only guide was the Gyro-Compass.

Finally, the ship arrived safely at the Port of Suez.

The Pilot turned to the Captain, and said, "If I didn't do it myself I wouldn't believe it was possible!"

This true story is another of the many examples of the performances being turned in by Sperry Gyro-Compasses on the waterways of the world.

Sperry Gyroscope Company INC. GREAT NECK, N. Y.

Division of the Sperry Corporation

★

LOS ANGELES • SAN FRANCISCO • NEW ORLEANS
HONOLULU • CLEVELAND • SEATTLE

GYROSCOPICS • ELECTRONICS • RADAR • AUTOMATIC COMPUTATION • SERVO-MECHANISMS

OUR DELIVERIES ARE GOOD AT PRESENT

QUALITY and WORKMANSHIP UNSURPASSED

★ KEY CITY SHACKLES
are made in conformity with
BUREAU OF SHIP AD INTERIM SPECIFICATIONS
42C 19(INT), dated August 15th, 1943

SHACKLES
(FORGED BY)
KEY CITY





are made in sizes from 3/4" through 2 1/2", Anchor or Chain Type; choice of Screw Pin, Loose Pin or Safety Bolt and Cotter Pin; Black or Galvanized, as desired. Also special dimensions and intermediate sizes can be supplied.

Representative: SHARAI & SHELDON, 808A MAISON BLANCHE BLDG., NEW ORLEANS 16, LA.

KEY CITY BOLT and SPIKE WORKS, INC. • Broadway at 11th St. — Long Island City 2, N. Y.

(Mfrs. of FORGINGS, SHACKLES, LARGE BOLTS, THREADED RODS . . . Specializing in the Marine Field)

L. A. Gets 2nd Star

Los Angeles Steel Casting Co., the oldest foundry in the Los Angeles area, has been awarded a second gold star for addition to their Maritime "M" awards. The company has contributed greatly toward the building of many ships, urgently needed for successfully prosecuting the war.

Farr Company Gets "E" Award

Award of the coveted Army-Navy "E" to the Farr Company, manufacturers of Far-Air air filters, Los Angeles, has been announced by the Western District headquarters of the Air Technical Service Command.

In connection with the award it was announced that in three years production has tripled. As a result, one out of every three airplanes produced is equipped with Farr Carburetor Air Filters.

Farris Engineering Company and its employees have been awarded the Maritime "M" which has been won by only about 400 concerns throughout the country. The award was granted for the outstanding production record made by Farris in building safety and relief valves and controls for the shipbuilding program. The burgee was presented by Charles E. Walsh, Jr., Head of the Procurement Division of the Maritime Department, and was accepted on behalf of the employees by Cyrill A. M. Masek.

The Kennedy Valve Mfg. Co., of Elmira, N. Y., has been awarded a second star on their Maritime pennant for continued excellence in production of valves for the War program. This award was granted to the Kennedy employees for their extended efforts to maintain prompt completion of the many orders for Kennedy valves for wartime shipbuilding requirements.

Farr Company Gets "Army-Navy "E" Award



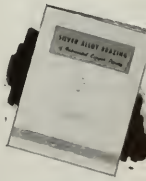


Section of 14" copper piping fabricated throughout by brazing with EASY-FLO No. 3.

SILVER ALLOY BRAZED Copper Piping

Under the impetus of war production the old, forge-and-spelter method of brazing copper piping has given way to the modern procedure of brazing with the silver alloys Sil-Fos, Easy-Flo and Easy-Flo No. 3. And small wonder — for silver alloy brazing means (1) simplified and faster application — (2) a minimum of finishing — (3) maximum strength and leak-tightness — (4) lower costs.

GET DETAILS IN THIS BULLETIN



It gives step-by-step silver alloy brazing procedure in fabricating copper piping — brazing longitudinal seams — making branch outlets and pipe reductions — joining outlets and flanges to fabricated copper piping — brazing circumferential rings on expansion joints. A copy of this informative bulletin will be sent to you on request. Write for your copy today.

ARMY E NAVY

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Agents in Principal Cities



David K. Steward of Pacific Marine Surveys. Center: R. E. Fritsch with Tube Turns of Louisville, Ky. Right: George T. Badger, chief sales engineer of Paxton Diesel Engineering Co.

New Surveyor at Pedro

David K. Steward is the manager of Pacific Marine Surveys of San Pedro, California—a firm functioning as marine surveyors for shipping companies, operators and insurance companies.

He has an interesting background of sea duty working up to chief engineer with the Texas Oil Company.

During the past four years, Steward has been supervising engineer for Westinghouse at the Consolidated Yards in Southern California and has supervised the installation of main propulsion turbines and gears, main and auxiliary condensing equipment and turbo-generator sets on the U. S. Maritime C-1 type vessels. He also represented the manufacturers on dock and official acceptance trials.

Besides the building program, Dave has supervised repairs of turbines on numerous vessels entering the Los Angeles harbor. With this background he is well qualified to make intelligent and adequate marine surveys.

Port Engineer for Alcoa

Fred H. Brewster has been recently appointed port engineer of the Alcoa Steamship Company's San Francisco Office. Serving as assistant port engineer is Walter E. Hinshaw, who has permanently joined the San Francisco staff.

Fritsch President of Tube Turns

R. E. Fritsch, vice president of Tube Turns, Louisville, Ky. since 1929, has been elected president, succeeding Walter H. Girdler, Sr., who died on January 7. He joined Mr. Girdler when Tube Turns was originally organized and he has had a major part in the firm's rapid growth.

Mr. Fritsch continues as vice president and a member of the board of directors of The Girdler Corporation, of which Tube Turns is an affiliate. He is a member of the American Society for Metals and the American Welding Society.

Tube Turns manufactures seamless welding fittings and flanges for ships, power plants, refineries and many other purposes, and is a large-scale producer of aluminum and steel forgings for industry.

Badger with Paxton Diesel Firm

Appointment of George T. Badger of Chicago as chief sales engineer of the Paxton Diesel Engineering Company, newly-formed subsidiary of the Paxton-Mitchell Company at Omaha, Nebraska, was announced late in January by James L. Paxton, Jr., president of both companies.

Mr. Badger comes to his new position after 13 years with the Minneapolis-Honeywell Regulator Company. For the past five years he has been sales engineer in charge of railway controls market development and previously was manager of the company's Indianapolis branch. He is an engineering graduate, Purdue University.

He will direct market development of Diesel specialties and parts manufactured by the Paxton Diesel Engineering Company, which will also maintain a diesel repair service for railroads and other operators of diesel engines.

"Well Deserved Promotion"

A cablegram received by Dr. Henry F. Grady, president of the San Francisco Chamber of Commerce, from Colonel J. E. Butterworth in Italy announced that Captain R. V. Grady, eldest of Dr. Grady's three sons, all of whom are in the service, had just won a "well deserved promotion" to the rank of major. Colonel Butterworth is Major Grady's commanding officer.

Young Grady, who is only 26, received his commission in the Army three years ago and has served in Egypt, Africa, Great Britain and Italy. He is presently engaged in economic work at Allied Military Headquarters for the Mediterranean area located in Italy.

Major Grady attended school in Berkeley and is well known in the Bay Area. A brother, John W. Grady, is with the Army Transport Service in the South Pacific, and another brother, Henry F. Grady, Jr., is third mate on an Army Hospital Ship in the Mediterranean area. An only sister, Mrs. John Davies, Jr., is the wife of a State Department secretary recently assigned to the U. S. Embassy at Moscow.

XZIT

Cleans Out Soot and Fire-Scale
Eliminates Sparking
Extinguishes Stack Fires

XZIT not only gets rid of soot and fire-scale from fire-box to top of stack, but checks further carbon deposits. This scientifically compounded chemical, which is fed into the fire-box while the boiler remains in full operation, reduces the residual deposits of combustion, prevents sparking, and puts out stack fires instantly.

Continued use of XZIT prevents further deposits, pitting and corrosion. The cost of XZIT is insignificant, compared with the time, labor and fuel it saves.

Send for details.

XZIT SALES CO.

1031 CLINTON STREET, HOBOKEN, N. J.
200 DAVIS STREET, SAN FRANCISCO, CALIF.

Offices in all principal cities

WHY RELINE

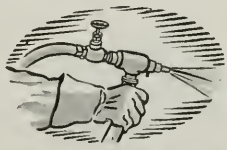
Keep Bricks New
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BRICKSEAL

Highly-glazed—Vitrified Monolithic Coating

Simply brush or spray Brickseal over your refractory lining, and start boiler operation at once. Furnace heat vitrifies Brickseal permanently into all pores, cracks and joints, binding the bricks with a highly-glazed, monolithic coating, impervious to slagging, clinkering, corrosive vapors, flame abrasion and air infiltration.

Sudden temperature changes cannot crack or loosen Brickseal because it remains semi-plastic until boiler cools. Brickseal costs only a fraction of a reline job, and assures long, efficient, trouble-free boiler operation. Write now for sample or Brickseal engineer.



BRICKSEAL
REFRACTORY CO.
1029 CLINTON ST., HOBOKEN, N. J.



Ben S. Wright, newly appointed manager of the Cleveland office of Owens-Corning Fiberglas Corporation.

Fiberglas Shifts

Ben S. Wright, since November, 1940, manager of the Fiberglas Fabrics Division in the Toledo general offices, has been transferred to Cleveland as manager of the firm's branch office there. He succeeds W. H. Atkinson who becomes manager of the Chicago branch office.

Since becoming associated with the Fiberglas Corporation more than four years ago, Mr. Wright has specialized in field development work extending the use of Fiberglas textiles for such applications as parachute flare shades, and in such essential markets as plastics reinforcement, coated fabrics applications, and admixtures of Fiberglas with other textile fibers.

American President Appoints Ronald M. Delong

American President Lines recently announced the appointment of Ronald M. Delong as general passenger agent. He will have charge of passenger matters in Southern California, Arizona and New Mexico, with headquarters in Los Angeles, Calif.

MARINE AND INDUSTRIAL EQUIPMENT

THOMAS A. SHORT CO.

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AMERCOAT SALES AGENCY
Corrosion and Acid Proof Sprayable Plastic Coatings for Concrete, Metal and Wood.

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Instruments for Pressure, Temperature and Gas Analysis.

BART LABORATORIES
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CATERPILLAR TRACTOR COMPANY
Marine Diesel Power Plants and Marine Diesel Auxiliary Engines.

DIEHL MANUFACTURING COMPANY
Electric Motors, Generators, Fans and Ventilating Equipment.

HYDE WINDLASS COMPANY
Deck Machinery and Hoisting Equipment.

INTER-COASTAL PAINT CORPORATION
Consol Rust Remover and Consol Paint.

LUCIEN Q. MOFFITT, INC.
Goodrich Cutless Rubber Bearing.

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Electric Torsionmeters, Salinity Indicators, Oil & Water Separators, Mechanical & Pneumatic Revolution Counters, Engine Direction Indicetors, Logometers, Shaft Clearance Indicators, Electric Whistle Systems, Revolution Telegraphs.

WM. W. NUGENT & COMPANY
Oil Filters and Oiling Devices.

SEDGWICK MACHINE WORKS
Ammunition Hoists, Elevators, Dumbwaiters.

SHENANGO-PENN MOLD COMPANY
Centrifugally Cast Metals and Alloys.

SHORT OIL DETECTOR
For Protection of Boilers.

SMOLENSKY VALVE COMPANY
Radialflow Noiseless Check Valves for all Pressures.

SUBMARINE SIGNAL COMPANY
Fathometers for Yachts, Freighters and Passenger Vessels.

U. S. METALLIC PACKING CORPORATION
A complete Packing Service for Marine and Stationary Engineers.

WATEROUS COMPANY
Rotary Pumps.



Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING CO.
Finderne Plant
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San Francisco Representatives:
MARINE ELECTRIC CO. — *Desk and Wall Fans*
THOMAS A. SHORT CO. — *Motors, Generators, Etc.*





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How would you like to take the wheel of the after-Victory Cruiser shown below? The sketch has been made from the completed blue prints of a production craft which will be built by Harbor Boat Building Company at the war's end, and which will combine our accumulated knowledge of prewar boat canstruction with impraved war-time methods of building fighting craft. Complete information on this cruiser is available only an personal request. No prospectus is availoble for generol distribution — but we'll show you more details in next month's advertisement.



LOS ANGELES HARBOR • TERMINAL ISLAND, CALIF.

HARBOR BOAT BUILDING CO.

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Marine
AMPLIFIED SOUND
Transmitting Systems



REMLER MICROPHONE—LOUDSPEAKER SYSTEMS transmit and amplify voice commands . . . cover selected spaces or reach every man aboard. Indispensable at sea, while docking or at dock. Vital in emergencies. Built to stand up under severe marine exposure . . . designed for practical seagoing men by a firm with twenty-five years experience in marine wireless and electronics. • Installations on passenger ships since 1936. Hundreds of installations since Pearl Harbor on U. S. Maritime Commission and U. S. Navy vessels to meet requirements of M. M. I. Div. U. S. Coast Guard and BuShips specifications.

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REMLER
Announcing & Communication Equipment
Manufacturers of Marine Communication Equipment Since 1918

Heads Calship's Public Relations

Appointment of John D. Burton as public relations manager was announced by the California Shipbuilding Corporation. Effective January 1, Burton assumed responsibility for the shipyard's public relations division, succeeding Joseph H. Wadsworth, who had resigned in order to take an extended rest on his ranch near Ventura.



John D. Burton, Long Beach Public Relations manager, California Shipbuilding Company.

In announcing the appointment, J. M. Warfield, assistant general manager of the California Shipbuilding Corporation, said that Burton will continue to represent the corporation on the War Manpower Commission's Labor-Management Committee. Calship War Bond sales and the Calship Cal-Donians charity functions, both of which have been under Burton's direction, were transferred from the industrial relations division to the public relations division.

Burton joined the Calship organization on April 22, 1941, as manager of its employee relations division, which embraced all service functions in the shipyard. His work at Calship has been closely affiliated with that of the public relations division. Burton has had extensive experience in personnel, sales and training work in Pennsylvania, Illinois, New Mexico and California.





DURAMETALLIC PACKING

TEMPERATURE OF 1000° F.

FULL METALLIC SETS MADE TO SPECIFICATIONS
FLEXIBLE PACKING TOOLS
DECK—STEAM—FIRE HOSE GASKETS

PACIFIC COAST RUBBER CO.

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Industrial Safety Society Meets in Los Angeles

At the first meeting of the year of the Southern California Industrial Safety Society in Los Angeles on January 9, S. T. (Ted) Smith, safety director of the Consolidated Steel Corp. and member of the Propeller Club Los Angeles-Long Beach Port, was installed as the new president by J. S. Rhodes, safety director of Douglas Aircraft Co.

An interesting resume of the Society's aims for the coming year was presented by President Smith and the chairmen of his supporting committees. One of the most important of these committees is that of Technical Research & Education, composed of L. L. Miller of Pacific Employers' Insurance Co., A M Smith of Archer & Co., A. W. Turner of Southern California Gas Co., and A. L. Allyn of Cardox-Western, Inc.

Guests from the armed forces included Col. Mike Lynch who recently returned from Aberdeen Proving Grounds to accept his former position as head of the Greater Los Angeles Safety Council.

Principal speaker of the evening was B. O. Pickard, of the Waterfront Employers' Association, one of the country's leading accident preventionists. Subject of his address was "What's Behind the Accident?"

Perfect—100 Per Cent!

United States Maritime Service officers considered it impossible until Ensign John A. Weber, Hood River, Oregon, did it. The 24-year-old officer candidate at the USMS Officers School, Alameda, turned in a 100 per cent perfect test that covered a five-day-long examination for a third mate's license for merchant marine officers. For the first time in the history of the Maritime Service, a paper containing nothing but perfect answers was submitted to the inspectors for the Bureau of Marine Inspection and Navigation.

Todd Carrier Proves Mettle in Trial Run

Superior performance marked the builder's trial run of the U.S. aircraft carrier Gilbert Islands, according to a recent announcement by Todd Shipyards Corp. The Gilbert Islands was built by the corporation's Tacoma, Washington, yard, the 56th warcraft to be completed there.

Handled by a picked crew of Todd workers with maritime experience, plus a group of navy men who will make up part of her regular crew, the big carrier proved to be "a Navy builder's dream."

Virtually a self-contained city within itself, the warship boasts the finest and most modern equipment that navy builders could find. Tens of thousands of items went into this new fighting ship to make it the acme of construction and operating efficiency.

Great Lakes Record

Fourteen Great Lakes shipyards in the period from May, 1942, to February 1, 1945, produced 184 vessels and 200 knocked-down barges valued at $241,122,132, L. R Sanford, director, Gulf-Great Lakes Region of the U.S. Maritime Commission announced recently.

BALANCE ENGINEERING COMPANY

DYNAMIC BALANCING • STATIC BALANCING

ABOARD SHIP
TURBINES
OTHER ROTORS
PORTABLE EQUIPMENT
CAPACITY 40 TONS

AT SHIPYARDS
PROPELLERS
FANS
PUMPS
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AT OUR SHOPS
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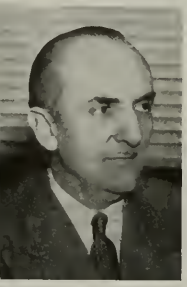
BALANCE ENGINEERING COMPANY

"AKIMOFF LICENSEE"

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HORESIDE PERSONALITIES





E. C. Rechtin, General Manager, San Pedro Yard, and W. A. Harrington, Ass't General Manager, San Pedro Yard, Bethlehem Steel Company.



Fruehauf men—H. F. Howard and A. K. Tice.

Bethlehem Shifts

E. C. Rechtin, formerly assistant manager of Bethlehem's San Pedro Shipyard, has been appointed general manager, succeeding Thomas B. Forster who recently resigned. **W. A. Harrington,** formerly sales-manager for the yard, is appointed assistant general manager.

Mr. Rechtin, a graduate of Webb Institute of Naval Architecture, became affiliated with Bethlehem when the Company purchased United Shipyards in New York in 1938. Subsequently he was appointed assistant manager at San Pedro in charge of New Construction. A leader in the development of Welding for Marine Construction, he originated and developed the Serrated Channel System of Welded Construction and was active in developing the principles of welding large panel pre-assemblies and the application of automatic welding.

Mr. Harrington is well known in shipbuilding and ship repairing circles on the West Coast. He came to the San Pedro Yard as chief estimator in 1923 and later was general yard foreman and sales manager.

Foam System Changes

National Foam System, Inc., Philadelphia, announces two changes in its executive personnel for 1945.

Hart H. Fleming, a director of the firm for 15 years, has assumed the vice presidency of the company which, during the war, is producing highly specialized chemicals and apparatus for extinguishing fires aboard American combat vessels, and in peacetime supplies equipment and foam to extinguish petroleum and chemical plant fires and to protect airport installations and aircraft. He also continues as a director.

G. Gordon Urquhart has resigned as vice president of the company, but is continuing to serve the firm as a technical consultant. He is joining the Wilmington Chemical Corporation, Wilmington, Delaware, manufacturers of rubber plasticizers, as president.

Fruehauf Appointments

Harvey C. Fruehauf, president Fruehauf Trailer Company, has just announced the appointment of **H. F. Howard** as vice president in charge of manufacturing. Howard, who has been general plant manager of Chevrolet Division Factories in Flint, Michigan, for the past seven years, will be in charge of manufacturing operations at all Fruehauf plants and will make his headquarters in Detroit.

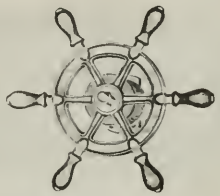
Howard is widely known and highly regarded throughout the automotive industry for his ability in manufacture and production. During his seven years as head of the Chevrolet, Flint plant, he established an enviable reputation in bringing this organization to a high peak of efficiency.

Harvey C. Fruehauf has also announced the promotion of **A. K. Tice** who for the past several years has been in charge of the Sales Department. Effective with the announcement by Mr. Fruehauf, Mr. Tice becomes vice president as well as Director of Sales.

Another Spoke in the Wheel of Progress



OUR FLAG FACTORY



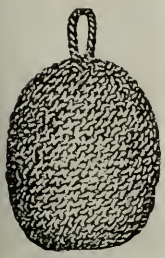
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CARGO FALLS • PREVENTERS • BRIDLES • SLINGS



WE MAKE ALL ROPE SPLICES —
Sea Anchors • Barrel Bumpers • Boatswain Chairs • Ship Fenders • Cargo Nets • Debarkation Nets • Pilot and Jacob Ladders

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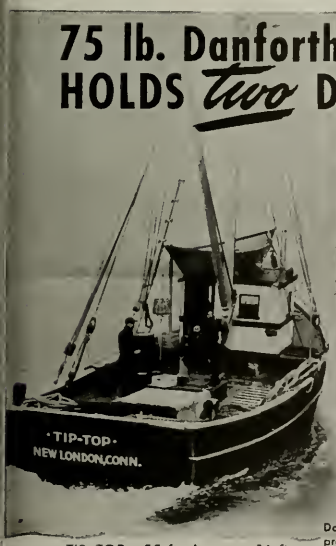
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75 lb. Danforth HOLDS *two* DRAGGERS IN HURRICANE



• *TIP TOP—55-ft. dragger; 16-ft. beam; 7-ft. draft; 34 tons.*



From a statement by Capt. George Berg, Mystic, Connecticut, Skipper of the TIP TOP:

"During the Sept. 14th hurricane at 9:30 P.M., half an hour before the height of the storm, we could see that it was necessary to get away from the dock and we did so. As soon as we were post the end of the dock, we anchored. We couldn't see anything anyway. • We used a 3½" manila rope spliced into a thimble. We let out 25 fathoms. The wind was blowing Northeast at about 80 miles per hour and we were in twenty feet of water. • The CARL J., a sister ship, was pounding against the dock. She had no anchor. We swung her a line and hauled her away. When the wind shifted unexpectedly Northwest, we turned sharply. We both lay with the one 75-lb. Danforth and did not drag. • The anchor came up easily the next morning and the rope showed how deeply the anchor had buried itself in the soft muddy bottom. • To us this was a remarkable feat because one of the other draggers, a lighter boat, had a 200-lb. regular type anchor and dragged dangerously throughout the storm. • A 75-lb. Danforth that held two 34-ton draggers is the best recommendation I could give or receive. I've never seen anything like it. I'd go on record anytime to recommend the Danforth anchor."

For professional data, write

Danforth Anchors protected by U. S. and Foreign Patents



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• *BUY WAR BONDS*

MARINE PAINTS FOR EVERY NEED
PACIFIC PAINT & VARNISH CO.
544 Market Street - SAN FRANCISCO - EXbrook 3038

Shoreside Personalities

Appointment

U. E. Sandelin has been appointed manager of the Allis-Chalmers Manufacturing Company's Seattle, Washington, district office, it was announced at Milwaukee, Wisconsin, by Frank Angle, manager of the company's 60 district and branch offices.

Sandelin succeeds A. J. Schmitz, who has been named Pacific regional manager.

Before being appointed to the Seattle office, Sandelin was attached to the Allis-Chalmers district office in Washington, D. C., for three and one-half years. He also will supervise the Spokane, Washington, branch office.

FITLER "LUBRICORE"
SISAL MARINE ROPE



U S PATENT 2176422

Made with our Patented Center Yarn Lubrication Feature which provides greater protection against friction and deterioration, with longer retention of original strength and complete flexibility.

Identified by a divided Blue and Yellow marker.

"COMMANDO BRAND"
SISAL MARINE ROPE

Lubricated against internal friction and treated for water-repellency to keep it flexible whether wet or dry. Sold only in accordance with M-84 as amended.

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Offices and Warehouses
os Angeles, Calif., 1807 E. Olympic Blvd.
Portland, Ore., 1233 N. W. 12th Ave.

BACK THE ATTACK—
BUY MORE WAR BONDS

General Manager of Cunard White Star Line

Harold P. Borer, for 35 years connected with the Cunard Line and continuing when the White Star Line and the former merged into the Cunard White State Line, was named General Manager for the United States at a meeting of the board of directors held in Liverpool.



Above: Harold W. Keeley has been appointed director of personnel of Elliott Company, Jeannette, Pa., in addition to his duties as assistant secretary. A native of Boresville, Ohio, Keeley majored in business administration at La Salle University and has been associated with Elliott Company for 23 years.



Right: Arthur R. C. Markl.

Below: Harold P. Borer, widely known in West Coast steamship circles, has been promoted as United States general manager for the Cunard White Star Line.



Mr. Borer was named to succeed the late Robert H. Blake and he officially took over his new duties on February 1, after serving since 1924 as general passenger manager.

Director of Research at Tube Turns

J. D. Mattimore, director of research and development for Tube Turns, Louisville, Ky., announces the appointment of Arthur R. C. Markl to the post of chief research engineer. Before joining Tube Turns, Mr. Markl was for fourteen years associated with M. W. Kellogg Company, New York, last in charge of the development of equipment for oil refineries. He is a graduate of the Technical Institute of Munich and a member of the American Society of Civil Engineers.

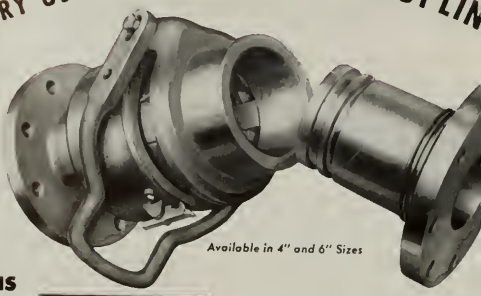
Public Relations Head At Timken

John J. Yezbak has been appointed manager of Public Relations as well as the News Bureau of the Timken Roller Bearing Company, Canton, Ohio, according to an announcement made by company officials. Yezbak, who has been head of the firm's news bureau since joining the company in June, 1943, is a graduate of New York University.

The newly-created public relations department was organized to coordinate all public relations activities of the company.

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ortland Shipping Club

Thursday, February 8, saw the ipping Club of Portland hold its gular monthly meeting at the Mult- omah Hotel. Speaker of the eve- ng, Charles Barbe of the KGW ws staff, told the gathering of the cessity and importance of looking rward right now to a greatly anged post-war world in which ipping would play a major role.

Mr. Barbe was introduced by George Milner, of the American Mail Line, who is vice president of the club. Also at the speaker's table were Thomas White, maritime attorney; J. C. Moore, general freight and passenger agent of the S. P. & S. Railway; Captain D. J. McGarity, district port director of the Office of Defense Transportation; Russell Ferguson, of the Waterfront Employers Association of Portland; A. W. Howard, owner and publisher of the Marine Guide; Frank T. Davis, secretary-treasurer of the Club, and President Charles Spear, manager of Interstate Terminal, who presided.

Mr. Barbe's speech was highly provocative and well received. He promised to return at a later date to give members a chance to question him further. More than sixty members attended with guests. Shipyards were represented by Captain Frank Gillard of the Kaiser interests and Bill Collins of Commercial Iron Works.

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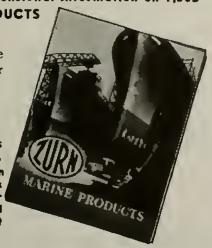
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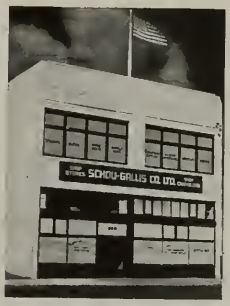
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Emark Promotes A. A. Manchester

Benjamin F. Morris, vice president and manager of the Emark Division of Thomas A. Edison, Inc., announces the appointment of A. A. "Jack" Manchester as assistant division manager of the Emark Division plant No. 1 at Kearny, N. J.

Mr. Manchester will continue to be in charge of sales, in which capacity he has served for several years. He has been with Thomas A. Edison, Inc., for approximately 25 years.





Left: A. A. Manchester, Emark Division of Edison Electric Co.

Right: Norman R. Miller, applications engineer with Westinghouse.

A Westinghouse Shift

Norman R. Miller, application engineer at San Francisco for the Marine Division, Westinghouse Electric & Manufacturing Co., for the past two years, has been transferred to Los Angeles to fill a similar post. In his new position, Mr. Miller will represent Westinghouse at the numerous shipyards and marine repair centers throughout the important Los Angeles area.

A native of New Jersey, Mr. Miller graduated from Cornell University in 1924 with a mechanical engineering degree, soon thereafter, joining Westinghouse as a graduate student, and later becoming an application engineer for the Company's Generator Division at East Pittsburgh. In early 1943 he was transferred to San Francisco as an application engineer for the Marine Division.

New District Manager

Interocean Steamship Corporation is pleased to announce the appointment of **Alf. E. Lee** as district manager at Seattle. Mr. Lee has already taken over his new duties after being released from his latest assignment in the Seattle Port of Embarkation, Army Transport Service. A resident of the Pacific Coast since 1907, he joined the Army Transport Service in October, 1941, and prior to that time was operating manager for almost 20 years of one of the Oriental services with headquarters in Seattle. His wide steamship experience, including chartering, particularly qualifies him for his new position.

Mrs. Walter Springer, who has been in the employ of Interocean since 1925 and has held the position of manager in Seattle since the early part of the war, will shortly retire from business to join her husband, who is manager of Weyerhaeuser Steamship Company in San Francisco.

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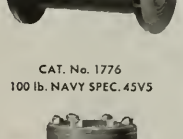
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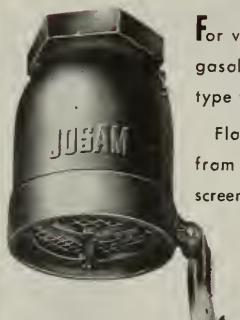
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Shoreside Personalities

New G. M. for San Leandro "Cat" Plant

W. O. Bates, Jr., has been appointed general manager of the San Leandro plant of Caterpillar Tractor Co.

This appointment fills a post that has been vacant since Gail Spain, former vice president in charge of San Leandro operations, transferred to Peoria to take over the direction of sales and advertising for Caterpillar Tractor Co.

Bates is a native of Joliet, Illinois; a graduate of Cornell University; a former associate with the Bates Machine and Tractor Co. and its successor, Foote Brothers Gear and Machine Co.; a former Administrative Engineer in the U.S. Army Ordnance; a former consulting engineer with offices in San Francisco, California, and an associate of Caterpillar Tractor Co. since 1937. Since November, 1942, he has been administrative vice president of Caterpillar Military Engine Co. at Decatur, Illinois.



W. O. Bates, Jr., new general manager, San Leandro plant, Caterpillar Tractor Co.

For the next four or five months, Mr. Bates will divide his time between Decatur and San Leandro, thereafter moving to the Bay Area as fulltime manager of the San Leandro plant.

Volunteer Port Security Force Praised

High tribute to the effective service being rendered by the Coast Guard's Volunteer Port Security Force in San Francisco and other parts of the country has been paid by Vice Admiral Waesche, commandant of the U. S. Coast Guard.

"Not a single serious loss has been suffered in any facility that has been under the protection of the Volunteer Temporary Reserve of the U. S. Coast Guard," he told a recent conference of the Temporary Reserve commanding officers.

Admiral Waesche's remarks and his emphasis on the continued need of volunteer service throughout the war have been cited by officers of the San Francisco Regiment in support of their efforts to keep the local organization up to maximum strength.

New recruits are needed, they explain, because of personnel losses due to moving, shifting business demands and the like of members of the Regiment. That the Regiment must be kept to maximum strength is emphasized the more, they say, because of San Francisco's steadily growing importance as a port of embarkation.

Recruiting is taking place at Coast Guard headquarters in the Appraisers' building, Washington and Sansome Streets, DOuglas 0842, extension 276.

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Shoreside Personalities

Captain J. E. Hamilton (CEC) USN, retired, has replaced Commander Henry T. Koonce, (CEC) USN, as planning officer at the U. S. Naval Drydocks, Terminal Island, Wilmington. Captain Koonce has been ordered to sea duty.

A graduate of the Naval Academy, class of '21, Captain Hamilton has just completed eight years service in the Bureau of Ships, Washington, D. C. During his 24 years in the Navy he has seen duty in nearly every large Naval port in the United States, Hawaii and the Philippines.

Captain Hamilton approves all work on ships sent to the drydocks.

The hundreds of friends of **Joe Fitzgerald** will be pleased to learn that he is now stationed in San Francisco with the U. S. Inspection Service.

The one-time chief engineer with the old Panama Mail Line and later with the Grace Line aboard the SS Guatemala, and last, head of the propulsion department on the big Santa Elena, has had a long stay with the Federal department of hulls and boilers in Boston, Massachusetts.

Monroe Jackson, assistant chief of the production department of the U. S. Maritime Commission under J. A. McKeown in the general West Coast offices in Oakland, resigned effective March 1, to return to the Philippines to become associated with the department of the United States Engineers.

Port Engineer With McCormick

E. L. Harris, formerly Port Engineer with the Alcoa Steamship Co., Inc., in San Francisco, is now attached to the staff of the Port Engineer of the McCormick Steamship Company. He is now outside in charge of all that company's work on all ships in the Pacific Coast territory.

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Mariners Hear Story Of Navy Supply

At the February meeting of the Mariners Club of California, held on February 7, Thomas A. Short introduced Lt. R. B. M. Smith (SC) USNR of the U. S. Naval Supply Depot. The naval officer gave the audience an interesting description of the task being performed by this branch of the service in keeping the supplies rolling to the many battle fronts.

Frank De Pue, the past president, was presented with a War Bond as a token of appreciation of his services as president during the past two years.

U. S. Plywood's New Vice President

Monroe W. Pollack, Metropolitan division manager of United States Plywood Corporation, has been elected a vice president, it was announced. His election coincides with the start of his twenty-fifth year with the U. S. Plywood, with whom he began as a stenographer on Washington's birthday, 1921. Mr. Pollack is also a director of the company.

Shortly after joining the organization he became office manager and in 1924 opened the warehouse in Detroit which marked the corporation's first expansion outside New York. He stayed on as Detroit manager until 1927, returning to New York in an executive sales capacity. He managed the Newark distributing unit for several years, returning to New York as Metropolitan division manager in 1941. He was elected a director in 1942.



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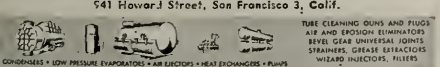
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New Division Director U.S. Maritime Commission

Creation of a Contract Settlement and Surplus Materials Division was announced by the United States Maritime Commission. This division is charged with the settlement of claims under terminated war contracts for supplies, shipbuilding and facilities, and with the redistribution of unrequired materials as well as the disposal of surplus property, except vessels.

Comprising this new division are the Settlement, Materials Utilization and Materials Disposal Sections in Washington. Maritime Settlement offices are situated in Chicago, Ill., New Orleans, La., Oakland, Calif., and Philadelphia, Penn.

The director is generally charged with the performance of Maritime Commission functions under the provisions of the Contract Settlement Act of 1944, the Surplus Property Act of 1944 and the various regulations issued by the Office of Settlement and the Surplus Property Board. He is authorized to make or approve binding settlements of war contractors' termination claims not in excess of $10,000; to grant partial payments not in excess of $10,000 on a single claim, or $50,000 on all unsettled claims of any single prime contractor; and to recommend settlements or partial payments in greater amounts to the Settlement Review Board.

The Commission has appointed **Burton L. Hunter,** formerly of Los Angeles and Honolulu, as director. For the last four years, Mr. Hunter, on the staff of the Bureau of the Budget, has been in charge of appropriation estimates for the Maritime Commission, the War Shipping Administration, and the Navy, State and Commerce Departments.



P. M. Robinson

Porker M. Robinson Joins Harry W. Parsons, Inc.

Harry W. Parsons announces the appointment of **Parker M. Robinson** to his engineering staff.

Mr. Robinson started his marine engineering career at the Fore River yard in 1911 and thereafter gained considerable experience on marine and stationary steam power equipment while serving as an engineer with Westinghouse at Philadelphia and on the Pacific Coast.

During the last war, he was a geared turbine engineer with the Emergency Fleet Corp., at the Philadelphia office.

For many years he was vice president of Hunt Mirk & Co., engineers and contractors of San Francisco. He has held chief engineer's position with the Ingalls Corp., of Pascagoula and the Western Pipe and Steel Co., of San Francisco.

He is a graduate of the University of Pittsburgh and Yale and a member of the Society of the Naval Architects and Marine Engineers.

Coast Marine Engineering Corp. Has Formal Opening

Coast Marine Engineering Corporation formally opened its offices of naval architecture and marine engineering design on February 2, 1945. The offices are located on the seventh floor of the Standard Building, 111 New Montgomery Street.

Westinghouse Shifts

W. O. Lippman has been appointed assistant to the president of the Westinghouse Electric and Manufacturing Company in charge of the Headquarters Manufacturing Department.

Mr. Lippman will continue as manager of the U.S. Naval Ordnance Plant at Canton, Ohio, operated by Westinghouse. He will have his headquarters in Pittsburgh and succeeds Ellis L. Spray, recently electric vice president and general manager of the Westinghouse Electric Elevator Company in Jersey City, N. J.

J. R. Weaver, manager U. S. Naval Ordnance Plant at Center Line, Mich., was named works manager of the East Springfield, Mass., Works of the Electric Appliance Division, succeeding Mr. Lippman, and will also continue to head the Michigan plant.



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NECROLOGY

Donald D. Lonegran, chief clerk for the Transmarine Navigation Company at Terminal Island, San Pedro, died suddenly last month after being stricken previously with a heart attack. He was 44.

Mr. Lonegran was known to hundreds of steamship men afloat and ashore. He was born in Los Angeles and started his steamship career with Swayne & Hoyt, serving both in Southern California and San Francisco. He has been with Transmarine Navigation Co. since 1940.

William Grant, who directed attention to his abilities as a shipwright when, in 1919, he supervised the launching of six big freighters within 57 minutes from the ways of the Moore Dry Dock Company, passed away on February 7 at his home in San Francisco. He was 85.

Mr. Grant supervised the launching of many ocean-going cargo freighters in World War I. He has been identified with Pacific Coast shipbuilding from 1880 until shortly before his death.

Popular Officer Missing

First Officer **William Weldon,** San Francisco, a commander in the United States Maritime Service and a 1941 graduate of the California Maritime Academy, is reported as "missing and presumed lost" with his ship during the recent occupation of the port of Antwerp. Commander Weldon was sailing with the Isthmian Steamship Line. Every member of the crew with the exception of Weldon and the chief engineer were saved in the sinking, which was attributed to an enemy mine. Weldom was married last year to Miss June McGeachen, daughter of Captain Flannery, official of the Isthmian Steamship Line.

George Flood, who with his late twin brother, James, headed the well-known firm of Flood Brothers shipping concern, died February 1, at the age of 81.

The firm of Flood Brothers has been prominent in shipping since early days, engaging in trading with Alaska, Siberia, the South Seas and Dutch East Indies.

Valve Manufacturer Passes

Eshelby F. Lunken, president of The Lunkenheimer Company, Cincinnati, Ohio, valve manufacturers, died suddenly January 25, of a heart attack. He was 54 years of age.

Mr. Lunken was a son of Edmund H. Lunken, who at the time of his death in July, 1944, was chairman of the board. He was connected with The Lunkenheimer Company for 35 years and served as President 26 years. He was a grandson of Frederick Lunkenheimer, founder of the company.

Retired Auditor Passes

Edward Randall, retired General Auditor for Fireman's Fund, Home Fire & Marine and Western National insurance companies, died at his home in San Francisco on February 1, after a long illness.



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Moves Into New Plant

All manufacturing activities of Glenn-Roberts Company, pioneer manufacturers of transformer-type arc welding equipment, are now being conducted in the firm's new factory at 3100 East 10th Street, Oakland 1, California.

The new structure, of modern design throughout, houses administrative offices, engineering department, a fully-equipped electrical research and testing laboratory, machine shop, stamping, coil winding, impregnating and baking departments, mechanized assembly line for welders, and complete production facilities for the company's electronic components manufacturing division.

SPEEDING THE SS CLEARWATER ON ITS WAY



Launching party of the SS Clearwater Victory at The Permanente Metals Corporation, Yard One, on January 20. Saluting the vessel as she slides down the ways are the sponsor (center) Mrs. Virginia Morgan Kennedy, selected by City of Clearwater, Florida, wife of Lt. Jefferson Kennedy, USN; Matron of honor (left from sponsor) is Mrs. Robert Dahlof; flower girl is Mrs. Blanche Lyon, native of Florida and Yard One employee; Triggerman of the day is Lt. Jefferson Kennedy, USN; Master of Ceremonies, M. G. Vanderwende, asst. mgr. Yard One. (Beside him: Norris Nash, director of Public Relations, Richmond Yards.)

Increased shipping resulted in the introduction in the State Senate of California of a bill allowing the licensing of 10 additional bar pilots for the harbor of San Francisco. The pilots are appointed by the Governor.

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IN WAR • • •

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Matson mans, supplies and repairs the ships, arranges for docking and port facilities and for the loading and discharging of passengers and cargoes.

IN PEACE • • •

When Victory is won, Matson *plans* to restore all of its pre-war services on an expanded scale . . . replace lost or war-worn equipment with speedy, new craft of latest design and mode . . . and, for public convenience and necessity, provide the best overseas transportation that ingenuity, a record of progressive improvements and more than 60 years of experience can devise.

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Mangrum, Holbrook & Elkus Gets Maritime "M" Award

Carl W. Flesher, regional director of production, United States Maritime Commission, presented the Maritime "M" award to the men and women of Mangrum Holbrook & Elkus at ceremonies held at the Company's plant in San Francisco, February 10. The presentation was made to Richard J. Elkus, president of the firm. It was given in recognition of the outstanding achievement by the company in production of equipment for the Maritime Fleet.

Awarding of the Maritime Merit Badge was also made by Flesher, to each employee of the firm for the personal effort each one has made toward the outstanding production job.

Clay P. Bedford, vice president and general manager of Kaiser Richmond Shipyards, acted as master of ceremonies. Music was furnished by the U. S. Coast Guard Receiving Station Band and the Harmonettes.

Mangrum Holbrook & Elkus is normally manufacturers and suppliers of equipment for restaurants, hotels, cafes, etc., but since the beginning of the war, nearly all of the production has been for the war effort in the manufacture of galley equipment, hatches, ladders, vents, grills and many other items needed for our merchant and fighting fleet.



Holding Moritime "M" Flag (left to right) are Carl W. Flesher, regional director of Production, U. S. Maritime Commission; Richard J. Elkus, president, Mangrum Holbrook & Elkus; Clay P. Bedford, vice president and general manager, Kaiser Richmond Shipyards.

Pacific MARINE REVIEW

APRIL
1945



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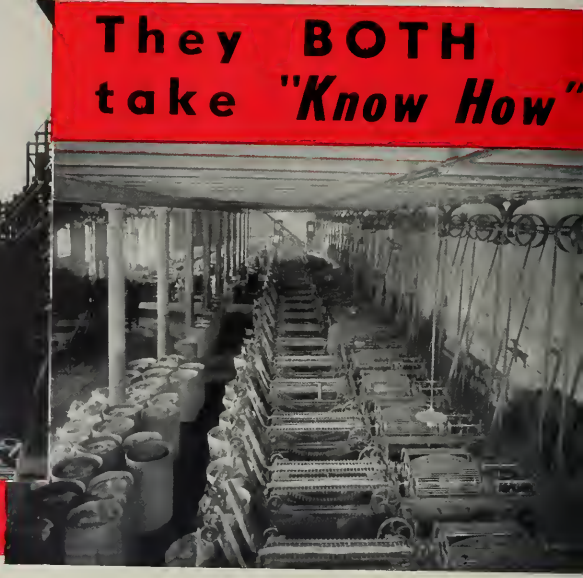
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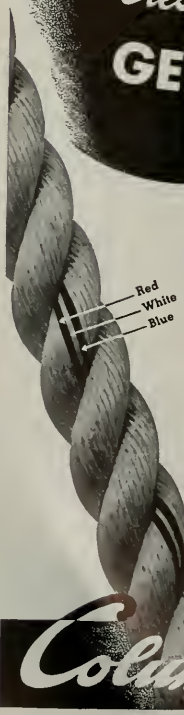
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ERRATUM—Our humble apologies to Jesse E. Saugstad for the wrong spelling of his surname on page 129 last month.

PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
Offices in: NEW YORK CITY . . . . . 16 West 46th Street, Telephone BRyant 9-8436
LOS ANGELES . . . . . 816 West 5th Street, 13. Telephone Michigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.





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ARMY E NAVY

Columbian ROPE IS A SINEW OF WAR

An Invocation for the Nations

Pacific MARINE REVIEW

America's four-year war shipbuilding record will stand in history as one of the mightiest industrial achievements of all time.

Contemporary writers and orators have exhausted the capacity of language in proclaiming this record to the world and in acclaiming its possibilities for victory and for healing the wounds of civilization.

Amid all the noise and confusion, the rattle of riveting guns and the hiss and glare of welding arcs, we are apt to lose perspective and think only of the material side of this tremendous human effort.

The keel layings, launchings and deliveries crowding each other day and night confuse the mind and lead to much "frantic" boasting and many a "foolish word." Occasionally amid the babel of voices there emerges a rare gem of pure thought that brings the mind back to the undergirding cause of all that is right and of all that is really worth while in this badly battered world.

Such is the invocation pronounced recently at the yard of the California Shipbuilding Corporation over the hull of the good steamship Santa Clara Victory, just before her launching, by the Rev. Charles J. Walsh, S.J., president of Santa Clara University. Here is the text of this invocation:

> Oh God, humbly we beg Thee to bless this ship. Let Thy guiding hand lead her safe and strong from shore to shore, from port to port. Mayst Thou, who didst form the elements from which she is made and didst form the men who made her, and the seas upon which, with Thy favor, she will ride, give unto her fair passage and true, on every mission upon which she is sent. Do Thou still the violent wave which may threaten her, as Thou didst still the waves of Galilee, or give her strength to overcome them and bid her, in the power of Thy Presence, to Fear Not.
>
> May her weighted cargoes bring us ever nearer to a just victory, and to a lasting and holy peace. May she serve well to bring help to our sons across the sea, and relief to the sufferings of all who are in need. May she help to re-form the marts of peace, that the things for which her name must stand in learning and in civilization may once more flourish upon the earth.
>
> Do Thou, Oh God, bless the men who built her, and bless them who shall be her crew, and teach us all that our life will pass like a ship in the waters, leaving no trace, unless we bow ever before Thee in humility and in love, to have Thy Hand to guide us, like unto her, unto a safe haven in Thy Heavenly Heart. AMEN.

Substituting a few very simple words here, we have an ideal invocation for the international conference that is to convene this month in San Francisco, or for any of the councils that are to meet to consider the arrangements for assuring peace and security in a post-war world.



328-foot Coast Guard Cutter.
(All photos courtesy U. S. Coast Guard)

This Patrol Frigate protects convoys.



THE U. S.

THE COAST GUARD today mans more ships for the Army and the Navy than it operates units of its own, such as cutters, patrol craft and fireboats.

Though the men who man these ships still wear the Coast Guard uniform, they are in many respects a part of the Army and the Navy, since their ships are under the control of, and directed by the strategic requirements of the two principal branches of the armed services.

Excluding the records of the Coast Guard's own cutters, whose exploits in combating enemy submarines have won fame, it is on the actions of these Coast Guard-manned ships that the service has built its record in this war as a small but potent arm of America's fighting forces.

As of December 31, 1944, the Coast Guard was manning 246 vessels for the Navy with a total complement of 39,550 officers and men; for the Army the Coast Guard was manning, on the same date, 278 craft with a total complement of 6266 officers and men.

Types and numbers of vessels operated for the Navy were as follows: APA transports, 9; AP transports, 11; AKA cargo ships, 3; AK cargo ships, 9; gasoline tankers, 14; gunboats, 8; destroyer escorts, 29; patrol frigates, 75; LCI (landing craft, in-



Small Freight Supply Ships are used in the island trade.

COAST GUARD AT WAR

By Comdr. Q. R. Walsh, USCG

fantry), 24; LST (landing ship, tanks), 34; SC (sub chasers), 6; PC (patrol craft), 4; district patrol craft, 17; miscellaneous craft, 3.

For the Army, the Coast Guard was manning: FS (freight, supply), 182; large tugs, 30; repair vessels, 6; tankers, 16; freight boats, 43; Headquarters detachment vessels, 1.

The physical characteristics of most of these types are well known, and it can be seen at a glance that the Coast Guard is manning a wide variety of ships, each of which has been called on to play a special wartime role. Each ship, ranging from such majestic AP transports as the Wakefield (the former Manhattan), down through the finely constructed AKA's (cargo ship, attack), the heavily armed PF's (patrol frigates), to the small and scrappy DE's (destroyer escorts) and SC's (sub chasers), has played its share in the winning of the war.

During 1942 the Coast Guard established and has since maintained two landing-boat training stations,

A Coast Guard-manned Destroyer Escort.





A Coast Guard-manned Combat Transport.

one for the training of Marines and one for the training of Army amphibious forces. Coast Guard personnel and Coast Guard-trained personnel have operated landing boats in every important amphibious landing made by our armed forces in this war.

As the need for men on beach patrol was lessened and as regular port security forces were replaced by volunteer units, the number of transports and other vessels manned was steadily increased.

The operation of the Coast Guard as a specialized service within the Navy has been facilitated by an arrangement which provides that the Coast Guard shall administer its own personnel, finance and supply, engineering, and other logistic services, subject only to general Navy policies and supervision.

This specialized wartime role of the Coast Guard is for the most part a relatively recent development. Prior to World War I, the cooperation of the Revenue Cutter Service with the Navy in time of war consisted largely of its transfer to Navy jurisdiction of certain of its cutters, together with their officers and men. Although these Cutter Service units were sometimes given special missions, it could hardly be said that they performed a well-defined, specialized role within the Navy. By the time the United States entered the war in 1917, however, the 1915 act establishing the Coast Guard had provided that the Coast Guard shall act "as a part of the Navy . . . in time of war or when the President shall so direct." This meant that the entire Service, and not merely certain of its cutters and their crews, were subject to wartime transfer to the Navy. As a consequence, our entry into the war had been preceded by the preparation of a mobilization plan for the Coast Guard as a whole, a plan which went into effect immediately after the signing of the declaration of war against Germany.



An LST manned by the Coast Guard.



A Troop Transport manned by the Coast Guard.



A Coast Guard-manned Cargo Ship.



The Coast Guard SC's patrol offshore.



USS Bellegrove, one of the LSD's built at Moore Dry Dock Co., Oakland, California.

(Official U. S. Navy Photograph)

Self-Propelled Drydocks

High-Powered, Speedy Vessels Can Dock, Transport and Repair Light Auxiliary Naval Craft

By T. Orchard Lisle

THIS WAR has produced the greatest variety as well as the largest number of ships in naval history. Some of them are radical in design, such as the LST's with their bow doors, and the LSD's which carry smaller craft in their capacious dock holds. To service the different types of landing craft and larger classes of warships, the Bureau of Yards and Docks of the Navy Department has constructed at a cost of over $511,000,000 no fewer than 183 drydocks. Most of these are of the non-propelled type, and some are graving basins. Some of the floating types have been built in sections, while others are in one piece with ship-shaped hulls but without propelling machinery.

One of the most noteworthy units in this dock construction program is the LSD, or landing ship dock, of which a number already are in service. Several were built by Moore Dry Dock Co., Oakland, California, from specifications and drawings by the Bureau of Ships, U. S. Navy, and Gibbs and Cox, naval architects, New York, who based their design for this entirely new class of ship on preliminary sketches and calculations evolved by British naval architects from Norwegian whaling mother ships. From this point, Americans took over. Rear Admiral E. L. Cochrane, Chief of the Bureau, took an outstanding personal interest in the development of these craft. After the first battle test, improvements were made and introduced into later models, and a most useful auxiliary class of vessel resulted.

Landing Ship Dock

The purpose of the landing ship dock to to carry smaller landing craft close to a hostile shore, at which point tanks on each side of the hull are flooded so that the stern sinks low enough in the water for the landing craft to float out fully loaded with men and supplies and take instant part in the invasion.

The interior of an LSD from the stern to a point well forward of amidships composes a dock basin with a door, or stern gate, at the after end to let the sea in and the landing craft out. Pumps and electrically-operated valves empty the side tanks, and the water in the dock runs out by gravity as the LSD rises to her normal draft position. The same pumps fill the side tanks to lower the stern in the water. The hollow interior is 390 ft. long by 40 ft. wide, forming ample space for taking aboard LCS's, LCV's and LCIL's. The latter is the largest craft yet handled, as the maximum depth of water in the dock is nine feet.

To facilitate the handling of smaller landing craft and mechanized units, two 35-ton Bayard electric cranes are installed on the deck, port and starboard. The Bayard cranes



The LCVP is one of the auxiliary craft carried and serviced by LSD's. *(Official U. S. Navy Photograph)*

LCI (L) sometimes inhabits the basin of an LSD. *(Official U. S. Navy Photograph)*



are each powered by three 50-hp electric motors for separate handling of the hoisting, topping and rotating motions. Three Bayard geared limit switches control these operations in the interest of the safety of personnel and equipment. Overall length of the crane platform is approximately 60 ft., and the total weight of the assembly is 74 tons. The entire unit, including the rotating machinery and control platform, is of Bayard design.

Repair Facilities

As a repair ship the LSD is invaluable from the point of view of being right on the spot. The various types of landing craft are taken aboard in the same manner as for transporting and the well deck is used as a drydock.

Machine shop, carpenter shop, shipfitter shop and welding facilities are available with the latest equipment. Repairs can be made to hulls, shafting, propellers, skegs and rudders. This repair work is all accomplished miles from regular Navy repair bases. When conditions permit, the flooded well deck of an LSD has served as a swimming pool for the crew, which may suggest one novel peacetime use.

Crew's Quarters

The ship's complement consists of 237 enlisted personnel and 17 officers. Living quarters are available for Army personnel when Army equipment is involved.

Officers and crew are taken aboard bodily with their vessels, and they use the "cargo-personnel" accommodations, as they are known, as well as messing facilities. When boats are not required to be carried, the spacious well deck can be used for carrying supplies and mechanized equipment just like an LST.

Stern of an AVP, showing Boyard crane of type used on LSD's.
(Photo courtesy of Lake Washington Shipyards E. W. Kenyon, Jr., Yard Photographer.)



Propulsion Plant

The LSD's are 450 feet long b.p. by 72 feet beam by 37 feet deep. The ships built at Moore's are propelled by twin Skinner Uniflow steam reciprocating engines of 3500 shp each at 210 rpm. These together give a total maximum output of 7400 shp. Steam at 250 psi is provided by two Babcock and Wilcox specially designed boilers having five Iowa burners each. Saturated steam is supplied to the engines at 225-250 lb. pressure. For removing oil from the condensate there is a purifier made by the Skinner Purifier Company of Detroit. There are two separate engine rooms, one on each side of the ship just forward of the dock.

Some of the LSD fleet are powered with Newport News geared turbines.

The landing ship dock illustrated is the Bellegrove, and she is shown on trials in San Francisco Bay. All the LSD's are named after schools, forts, memorials, famous landmarks, and presidents' birthplaces, some reminiscent of old Virginia, such as Ashland, Carter Hall, Epping Forrest, and Gunston Hall.

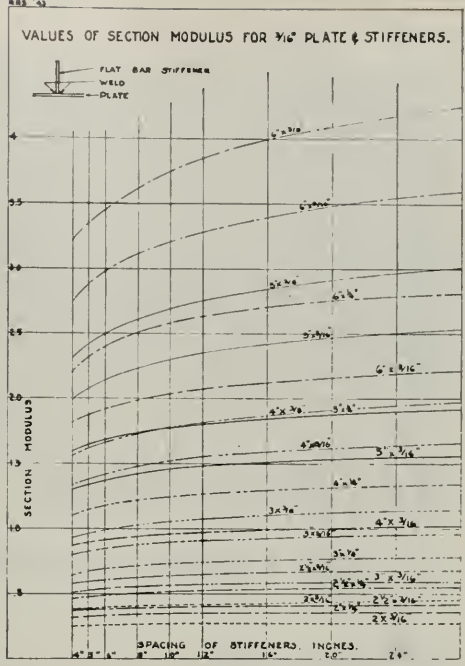
Larger Docks

ABSD's are large sectional docks with folding sides. There are ten sections per dock. Towed overseas separately to the point where required, the sections are joined together and then are capable of lifting the largest battleship or carrier when repairs are needed. The importance of these mobile docks relative to the quick salvage and repair following damage in combat is obvious. Four fighting ships that played a critical role in the second battle of the Philippines would not have been ready for that action if two of these docks had not been on hand.

Built at a special yard laid down at Stockton, California, by the Pollock - Stockton Shipbuilding Company, these docks are among the biggest floating craft built on the Pacific Coast. The owner and general manager of this yard is George Pollock, and Gordon Pollock is assistant general manager. Edgar White is chief engineer; H. A. Erickson, naval architect; W. M. Cathey and E. R. Ward, superintendants; and Allan Bullard, administration manager. The docks, which embody some remarkable new design features, were built at record speed. The official name is Advance Base Sectional Dry Dock.

Section Modulus for Welded Sections

Some years back Pacific Marine Review published a set of tables covering the physical properties of welded joints and sections compared with equivalent riveted joints and sections. Those tables excited a very considerable mass of inquiry, comment and criticism. Here we have a few additional tables and curves showing the sectional modulus for 3/16-inch plate sections and stiffeners. These were sent in by Ross Stewart of San Francisco. He and we invite analysis, criticism and comment from any practical welder or mathematically-inclined reader. We hope that all such will have as good a workout and field day over this contribution as they did over the former tables.



WELDED SECTIONS. 32 t OF PLATING INCLUDED IN SECTIONS. 7"×.1875" PLATING

6" X.1875" PL = 1.125 SQ. IN.

TOTAL AREA	I	X	X_1	SECTION WELDED	S
1.50	.467	.37	1.82	2 X 3/16 @ 1.275	.256
1.62	.58	.43	1.76	2 X 1/4 @ 1.7	.33
1.75	.69	.48	1.70	2 X 5/16 @ 2.12	.41
1.87	.79	.53	1.66	2 X 3/8 @ 2.55	.48
2.12	.96	.61	1.58	2 X 1/2 @ 3.4	.64
1.58	.838	.49	2.32	2 1/2 X 5/16 @ 1.6	.36
1.75	1.04	.53	2.16	2 1/2 X 1/4 @ 2.13	.49
1.91	1.24	.64	2.04	2 1/2 X 5/16 @ 2.66	.60
2.06	1.41	.70	1.98	2 1/2 X 3/8 @ 3.18	.71
2.37	1.72	.80	1.89	2 1/2 X 1/2 @ 4.23	.91
1.65	1.44	.61	2.37	3 X 5/16 @ 1.91	.57
1.87	1.71	.73	2.46	3 X 1/4 @ 2.55	.70
2.06	2.00	.82	2.37	3 X 5/16 @ 3.2	.84
2.25	2.27	.90	2.29	3 X 3/8 @ 3.83	.99
2.62	2.76	1.00	2.18	3 X 1/2 @ 5.1	1.26
1.78	2.08	.77	2.91	3 1/2 X 5/16 @ 2.25	.71
2.00	2.57	.90	2.73	3 1/2 X 1/4 @ 2.98	.92
2.22	3.06	1.01	2.69	3 1/2 X 5/16 @ 3.72	1.12
2.44	3.42	1.09	2.60	3 1/2 X 3/8 @ 4.46	1.31
2.87	4.11	1.23	2.46	3 1/2 X 1/2 @ 5.93	2.10
1.97	2.97	.93	3.26	4 X 5/16 @ 2.55	.81
2.12	3.69	1.08	3.11	4 X 1/4 @ 3.40	1.17
2.37	4.25	1.20	2.99	4 X 5/16 @ 4.25	1.42
2.62	4.82	1.29	2.89	4 X 3/8 @ 5.10	1.66
3.12	5.91	1.43	2.75	4 X 1/2 @ 6.80	2.11
2.06	5.60	1.27	3.91	5 X 5/16 @ 3.19	1.36
2.25	6.38	1.41	3.78	5 X 1/4 @ 4.25	1.69
2.69	7.66	1.60	3.59	5 X 5/16 @ 5.31	2.15
3.00	8.69	1.71	3.41	5 X 3/8 @ 6.36	2.60
3.38	10.42	1.88	3.20	5 X 1/2 @ 8.50	3.15

WELDED SECTIONS. 32 t OF PLATING INCLUDED IN SECTIONS. 7"×.1875" PLATING

6" X.1875" PL = 1.125 SQ. IN.

TOTAL AREA	I	X	X_1	SECTION WELDED	S
2.25	8.76	1.69	4.53	6 X 3/16 @ 3.83	1.96
2.62	10.33	1.86	4.35	6 X 1/4 @ 5.10	2.59
3.00	12.44	2.02	4.17	6 X 5/16 @ 6.38	3.28
3.37	15.93	2.16	4.03	6 X 3/8 @ 7.65	3.46
4.12	16.83	2.27	3.91	6 X 1/2 @ 10.20	4.31

WELDED SECTIONS. 32 t OF PLATING INCLUDED IN SECTIONS. 7"×.1875" PLATING

6 X.1875 = 1.125 SQ. IN.

TOTAL AREA	I	X	X_1	SECTION WELDED	S
1.65	.98	.56	1.62	L 2 X 1 7/16 x 5/16	.60
1.87	1.17	.65	1.54	L 2 X 1 7/16 x 1/2	.75
1.74	1.10	.61	1.58	L 2 X 1 1/2 x 5/16	.69
1.93	1.29	.69	1.49	L 2 X 1 1/2 x 3/8	.86
2.12	1.43	.75	1.43	L 2 X 1 1/2 x 1/2	.99
2.25	1.53	.80	1.33	L 2 X 1 1/2 x 5/8	1.10
1.88	1.25	.68	1.50	L 2 1/2 x 2 5/8	.84
2.06	1.51	.78	1.41	L 2 1/2 x 2 x 3/8	1.07
2.37	1.67	.84	1.34	L 2 1/2 x 2 x 1/2	1.35
2.68	1.78	.88	1.28	L 2 1/2 x 2 x 5/8	1.37
1.93	1.77	.81	1.62	L 2 1/2 x 2 1/2 x 5/16	1.09
2.18	2.01	.91	1.52	L 2 1/2 x 2 1/2 x 3/8	1.34
2.43	2.23	.99	1.45	L 2 1/2 x 2 1/2 x 1/2	1.58
2.87	2.46	1.05	1.35	L 2 1/2 x 2 1/2 x 5/8	1.77
1.84	1.86	.77	1.91	L 3 1/2 x 2 5/16	.96
2.06	2.09	.87	1.81	L 3 1/2 x 2 3/8	1.15
2.37	2.34	.95	1.74	L 3 1/2 x 2 1/2	1.33
2.68	2.56	1.01	1.68	L 3 1/2 x 2 5/8	1.51
1.93	2.38	.86	1.83	L 3 1/2 x 3 x 5/16	1.13
2.18	2.82	.97	1.71	L 3 1/2 x 3 x 3/8	1.42
2.43	2.72	1.05	1.63	L 3 1/2 x 3 x 1/2	1.66
2.67	2.94	1.12	1.56	L 3 1/2 x 3 x 5/8	1.88
3.12	3.21	1.19	1.50	L 3 1/2 x 3 x 3/4	2.15
2.62	2.37	.94	1.73	L 4 x 2 1/2 x 5/16	1.33
2.31	2.73	1.04	1.63	L 4 x 2 1/2 x 3/8	1.61
2.68	3.04	1.16	1.54	L 4 x 2 1/2 x 1/2	1.97
2.85	3.27	1.21	1.49	L 4 x 2 1/2 x 5/8	2.31
3.37	3.58	1.28	1.40	L 4 x 2 1/2 x 3/4	2.77
2.31	3.66	1.17	2.01	L 5 x 2 x 3/8	1.61
2.58	4.06	1.34	1.95	L 5 x 2 x 1/2	2.10

WELDED SECTIONS. 32 t OF PLATING INCLUDED IN SECTIONS. 7"×.1875" PLATING

6 X.1875 = 1.125 SQ. IN.

TOTAL AREA	I	X	X_1	SECTION WELDED	S
2.81	4.59	1.34	1.85	L 5 x 2 x 1/2	2.39
3.37	4.95	1.44	1.75	L 5 x 2 x 5/8	2.87
2.93	4.43	1.20	1.95	L 5 x 2 1/2 x 3/8	1.95
2.74	4.31	1.37	1.82	L 5 x 2 1/2 x 1/2	2.46
3.06	4.90	1.44	1.76	L 5 x 2 1/2 x 5/8	2.80
3.43	5.43	1.54	1.65	L 5 x 2 1/2 x 3/4	3.33
2.56	4.45	1.36	1.83	L 5 x 3 x 1/2	2.49
2.90	4.51	1.44	1.75	L 5 x 3 x 5/8	2.81
3.23	5.36	1.53	1.66	L 5 x 3 x 3/4	3.36
3.87	5.96	1.63	1.56	L 5 x 3 x 1	3.91
2.56	3.63	1.49	2.18	L 5 x 3 1/2 x 1/2	2.39
2.90	4.33	1.60	2.05	L 5 x 3 1/2 x 5/8	2.81
3.23	4.90	1.69	2.01	L 5 x 3 1/2 x 3/4	3.36
3.87	7.17	1.79	1.90	L 5 x 3 1/2 x 1	3.91
2.68	4.51	1.58	2.11	L 5 x 4 x 5/8	2.81
3.05	5.86	1.69	1.99	L 5 x 4 x 3/4	3.36
3.42	7.67	1.78	1.91	L 5 x 4 x 7/8	3.92
4.18	8.97	1.88	1.80	L 5 x 4 x 1	4.70
				L	
2.81	6.65	1.67	2.02	L 5 x 3 1/2 x 5/8	3.29
3.21	7.45	1.75	1.90	L 5 x 3 1/2 x 3/4	3.52
3.60	8.07	1.84	1.84	L 5 x 3 1/2 x 7/8	4.37
4.37	8.96	1.98	1.71	L 5 x 3 1/2 x 1	5.23
3.81	8.30	1.81	2.30	L 6 x 3 x 5/8	3.45
3.21	9.22	1.93	2.24	L 6 x 3 x 3/4	4.00
3.64	10.28	2.03	2.16	L 6 x 3 x 7/8	4.76
4.37	11.36	2.16	2.04	L 6 x 3 x 1	5.37
5.10	12.51	2.28	1.97	L 6 x 3 x 1 1/4	6.33



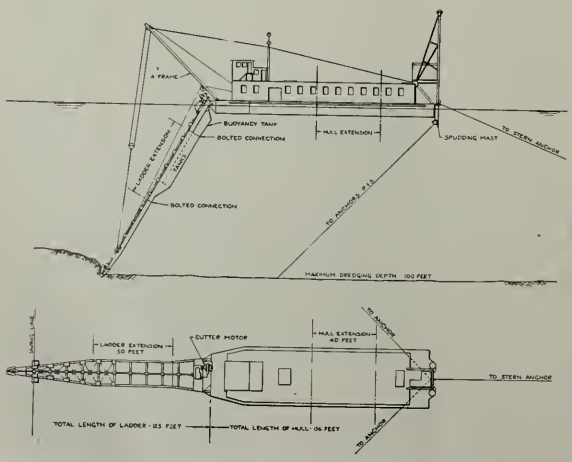
Altered dredge with digging ladder raised. Note cutter head and crew members servicing cutter shaft bearings.

ALTERATIONS
TO HYDRAULIC DREDGE PAPOOSE

By Andrew P. Hall

A RECENT CONTRACT awarded to the firm of Gerwick-Morrison-Twaits required the use of a hydraulic dredge capable of dredging at the very unusual depth of 100 feet, at mean low water, with a tidal variation of eight feet. Since the time allowed for the completion of the contract was comparatively short, it was decided to rent for this work the dredge Papoose from the Hydraulic Dredging Company of Oakland, and alter her in such a manner that the dredging program could be completed in the shortest possible time.

Profile and plan of dredge, showing alterations.



The Bethlehem Steel Company, Shipbuilding Division, builders of the Papoose in 1929, were awarded the contract for altering the dredge to meet the new conditions, and immediately commenced work on alteration plans and procedure in cooperation with the engineers for Gerwick-Morrison-Twaits.

Before alteration, the Papoose had a steel hull 96 feet long, 36 feet in beam, 8 feet deep, with a displacement of 550 tons. The main pumping equipment consisted of a pump driven by a General Electric motor of 1250 hp, and discharging through a 20-inch-diameter pipe. The digging ladder, 75 feet long and built of 36-inch I beams, could operate at a maximum depth of only 45 feet, with the ladder at a maximum angle of 45 degrees to the horizontal. The cutter head drive was a spline shaft with knuckle joints, driven through double reduction gearing (600 rpm to 30 rpm) by a General Electric

00-hp slip ring induction motor. 'ower was supplied by a submarine able from shore at 11,000 volts to ransformers located on the dredge. 'wo steel spuds were used, each 33 ıches in diameter and 65 feet long.)ne held the dredge in position :hile operating; the other was used or stepping ahead.

Increasing the operating depth of he dredge from 45 to 100 feet (con- idered by dredging engineers to be ear the limit of hydraulic dredge peration) necessitated a series of ex- ensive alterations, as outlined below:

(1) In order to provide sufficient uoyancy to carry the additional load, he length of the hull had to be in- reased from 96 to 136 feet, thereby ıcreasing the displacement of the redge from 550 tons to 800 tons.

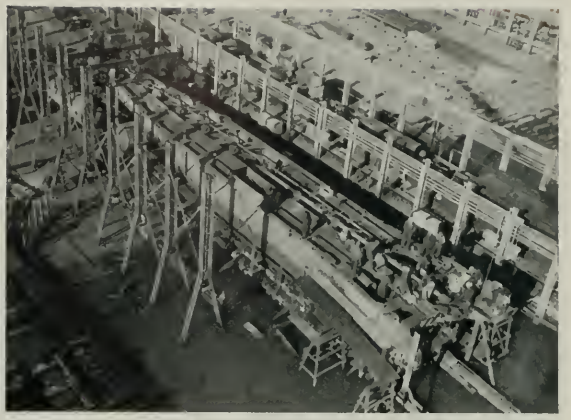
(2) The length of the digging lad- er had to be increased from 75 to 25 feet.

(3) To operate at maximum depth t was found necessary to have the ligger ladder at a maximum angle of 60 degrees to the horizontal in- tead of the former angle of 45 de- grees. Therefore the cutter drive ıad to be moved from the deck of he dredge to a position on the dig- ging ladder.

(4) The "A" frame supporting the adder hoisting tackle had to be engthened from 49 to 64 feet.

(5) Since the increased depth of vater was too great for the use of spuds, a new three-way anchor ar- rangement had to be provided.

The hull extension, ladder exten- ion, reduction gear foundation, and he gear box were all prefabricated before the dredge entered the Beth- ehem yard for alteration, since it was ssential that the dredge be out of commission for a minimum of time. n fact the dredge entered the ship-



125-foot-long digging ladder the day before launching. Because of the great size, the ladder was assembled in slip way and launched the same as a vessel.

yard on November 12, 1944, and left for service on January 1, 1945, an elapsed total time of only 48 days.

Hull Extension

Before the dredge entered the dry- dock in the shipyard, three pre- fabricated interlocking sections were prepared forming a 40-foot hull ex- tension when assembled and weigh- ing 85 tons complete. After the hull was landed on prepared greased skids in the drydock, it was cut in half in the vicinity of midships, and the two sections were pulled apart. Then the new midship sections were lowered into place and the whole was welded together. Butt welds around the com- plete girth of the vessel at each end were used to tie the new and old sections together, and in order to provide the required longitudinal strength, due to the increased length, additional doubler plates were riveted on the deck and the bottom shell. An intervening midship section of deckhouse 40 feet long was inserted as required.

Digging Ladder Alterations

The lengthening of the digging ladder was done on a shipbuilding slip. It was in this particular part of the job that the more complex engineering difficulties were encoun- terd. The original ladder was cut apart 21 feet forward of the trun- nions, and an extension of all-welded steel construction 50 feet long, 15 feet wide and 8 feet deep, and weigh- ing 28 tons, was inserted and con- nected to the webs and flanges of the ladder beams on the original structure by means of double strapped, bolted connections in which 304 1¼-inch-diameter fitted bolts

Digging ladder being launched. Note two rows of double-bolted connections between 50-foot extension and original ladder sections.





Spudding mast at stern of dredge. Mast is secured at bottom of hull with two removable pins so that it may be swung out of water to service lower sheaves. Stern anchor wire passes over sheave shown on deck.

were used. Bolted connections were used so that the ladder might easily be restored to the original 75 feet length on completion of the deep dredging operation.

In order to supply the necessary buoyancy for the new ladder extension, five permanent watertight buoyancy tanks were built in as an integral part of the ladder. Three of these were located in the extension, with total dimensions of 36 feet by 15 feet by 5 feet, while the remaining two were located under the hull end of the ladder, in size 17 feet long, 20 feet wide and 6 feet deep. The net buoyancy obtained from these tanks when the ladder is under water results in an uplift force of 42 tons at ladder trunnions. Since these tanks are true pressure vessels, the ½-inch top and bottom plating was supported by means of 4-inch-diameter pipe struts spaced 2 feet apart, the ½-inch side plating being framed in the usual manner. Bilge lines were run to the buoyancy tanks, so that in case of leakage they could be blown with air.

The operation of launching the ladder required quite an unusual arrangement. The 125-foot ladder weighs 90 tons without machinery and 130 tons when complete, and as the crane facilities over the shipbuilding slip were not capable of handling a structure of such a combination of weight and size, it was necessary to assemble the ladder in the slipway on a prepared cradle and launch it in the same manner as a vessel. Temporary buoyancy tanks were mounted at the cutter end of the ladder to maintain an even trim during the launching operation, and were removed after the ladder was installed on the dredge. The completed ladder, pulled down to the end of the ground ways, was floated off at high tide, towed away by tugs and placed in position at the bow of the dredge where the trunnions were connected.

Cutter Drive, Reduction Gear and Motor Alterations

A new fabricated all-welded waterproof gear case for the cutter drive was installed in a new position at the hull end of the ladder on an all-welded box-girder foundation. Due to careful layout and methods used in welded construction, an accurately fitted split line was so achieved that no machining was found to be necessary on completion of welding, resulting in a valuable saving of time. The original reduction gears and bearings were used, after altering them to provide for the thrust when operating at a 60-degree angle. The whole assembly of the foundation, gear box, bearings and gears were aligned and installed on the ladder prior to launching. However, in order to reduce the launching weight the gears and shafting had to be temporarily removed.

Since it was impossible to secure a new cutter motor, the old 300-h motor was altered for operation a a 60-degree angle in all types c weather. New end bells, spheric roller bearings and ventilation sy tem were installed. This job was de signed and built by the Pacific Ele tric Motor Company of Oaklanc California.

The pressure lubricating oil syster to the reduction gear and bearings i operated by a Worthington rotar pump delivering 60 gpm.

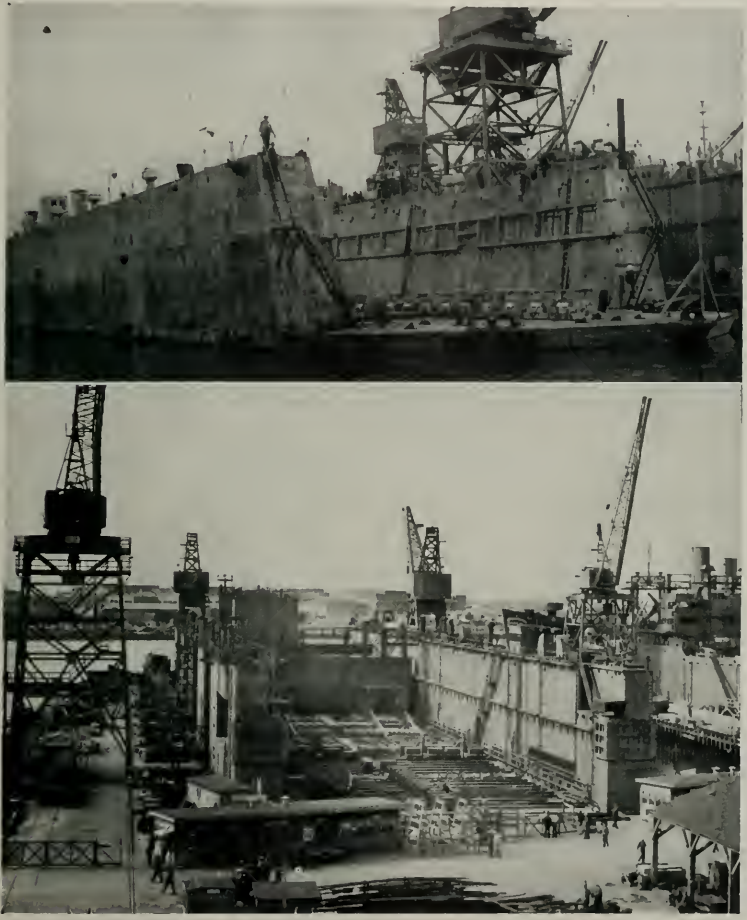
New Spudding Arrangement

A new three-way anchoring ar rangement had to be substituted fo the usual twin spudding arrangement This was done by leading three wir ropes from a point at the stern of the dredge to three widely separated an chors, as shown on the plan view o the drawing. Two of these wires are led diagonally forward under the dredge to anchors conveniently located on each side of the cut; the third is led to an anchor directly astern. A heavy all-welded spudding mast was constructed and mounted in a vertical position at the stern of the dredge, where it projects down below the hull for a distance of about four feet. It is fitted at the bottom with two sheaves mounted in swinging housings through which the two wire ropes pass from their position inside the mast, and then on under the full forward to their anchor locations. The stern anchor wire rope comes into a similar swing sheave located at deck level, directly above the spudding mast. These three wires pass to windlass drums, an additional drum having been installed for the third wire. An unusual feature is that the leverman has full pilot house control over all the movements of the dredge, with Selsyn motors indicating all movements of the three spudding wires.

The Papoose started operating on January 4, 1945, and after six weeks of operations, with no mechanical breakdowns, has averaged 11,000 yards of solids per day. A first cut was made to the 65-foot level, and the dredge is now working on the second cut to the 85-foot level. A third cut will be made to the final depth of 100 feet or more.

Engineering designs for the work were prepared by Paul J. Cushing, Associate Member of the A.S.C.E.; Paul M. Enright, Associate Member of the A.S.C.E.; and G. P. Cushing of Oakland, California. Final shop drawings were prepared by Bethlehem Shipbuilding Company.

New Docks at Moore



Top: New cement drydock, the Navy's ARDC-5, now in operation at the Moore Dry Dock Company, Oakland. This is the smaller of two new drydocks recently added to the plant's already well-rounded repair facilities. The cement drydock has an overall length of 389 ft., with an 84-ft. beam and a mean drop of 9 ft., one inch. It is equipped to take ships up to 2800 tons, such as destroyers, destroyer escorts, LCI's, tugs, towboats and barges.
Bottom: Larger of the two new Navy drydocks assigned to the company is the YFD-63, a big steel dock equipped to handle ships as big as the President Hoover or the Matsonia. It could accommodate a baby flattop, would dock at 10,000-ton cruiser with ease. The dock has an 18,000-ton capacity. Possessing a 35-ft. draft, it is 622 ft. long by 125 ft. wide and is 21 ft. from deck to keel. It can take on a ship having a 90-ft. beam and about 600 ft. in length.

DIESEL-PROPELLED TANKER T1-M-BT1

By L. Chris Norgaard

THE UNITED STATES Maritime Commission's latest design for U. S. Navy tankers is designated as design "T1-M-BT1." These tankers are single screw geared-diesel propelled. The vessels are of the single deck type, with forecastle, midship, and poop deckhouses, having a straight raked stem and cruiser stern. The cargo capacity is 30,000 barrels, which comprises a cargo of oil and gasoline.

The St. Johns River Shipbuilding Corporation of Jacksonville, Florida, has contracted to build 12 tankers of this design. The detail designs and working plans are furnished by the firm of Joslyn and Ryan, Naval Architects and Marine Engineers of San Francisco, California, who for the past four years have been one of the leading design agents for the U. S. Maritime Commission and the U. S. Navy.

Principal Characteristics

Length O. A.	325′ 2″
Length between perpendiculars	309′ 0″
Beam (molded)	48′ 2″
Depth to main deck (molded)	21′ 9″
Displacement (full load, tons)	5940
Design draft (full load)	19′ 0″
Shaft horsepower (normal)	1400

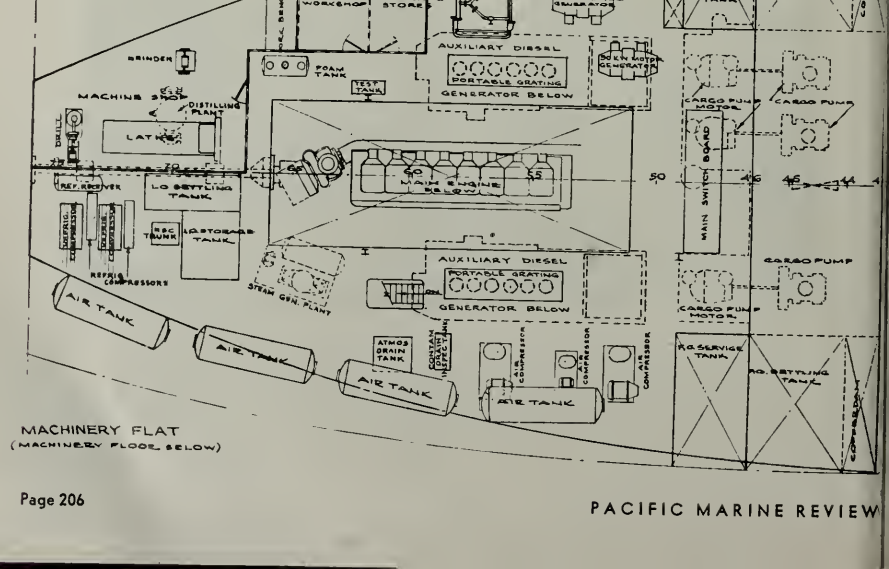
The ships will be constructed on the longitudinal system of framing throughout the cargo tanks, with the ends framed transversely. The hull structure will be of all-welded steel construction and oil tight for the extent of the cargo tanks. The ships are divided into six main cargo tanks, which are divided by a centerline longitudinal bulkhead, giving a total division of 12 cargo tanks. Each tank is fitted with an ullage trunk and connection will be fitted to each carg tank for Butterworth tank-cleanin

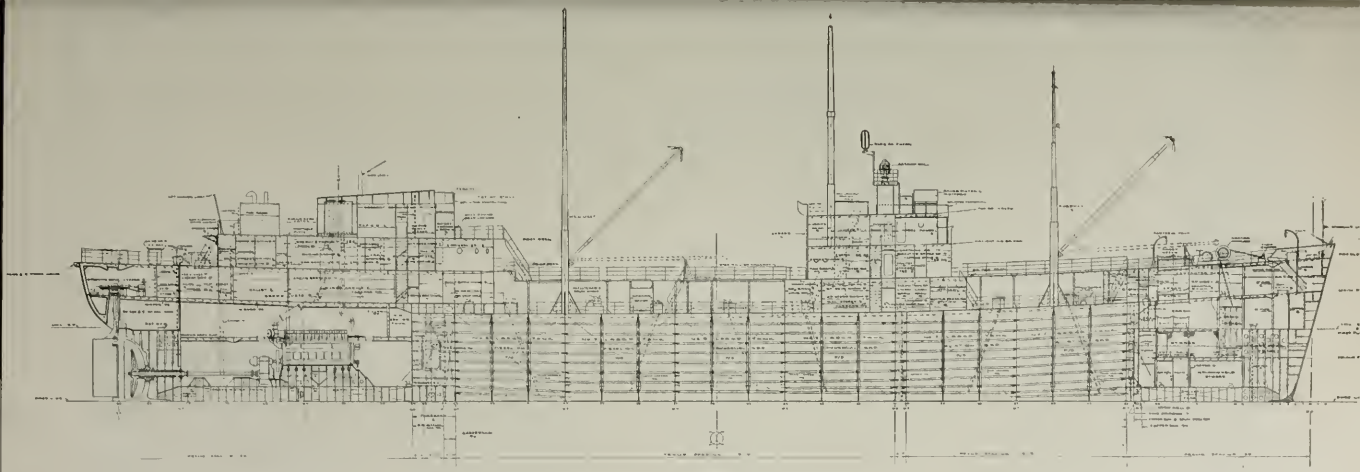
The rudder and stern post are "contra" form.

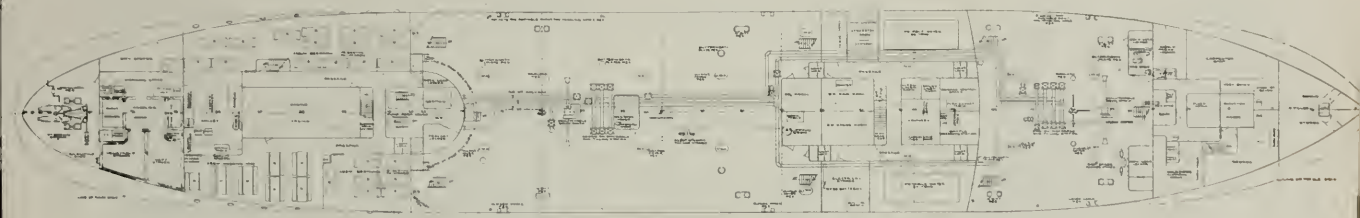
All watertight doors are of th quick-acting type. All joiner doo within the magnetic sphere of th compass are built of aluminum.

The masts of tapered tubular stee are stepped on the main deck. On three-ton cargo boom of tubular stee is rigged to both the mainmast an the foremast.

These vessels are being built unde the special survey of the America Bureau of Shipping, and classed A E oil carriers, "AMS" and "EAC." Equipment and construction mee the latest United States Coast Guar regulations, also the Internationa Load Line Convention for the Safet of Life at Sea, Senate Report No. 184







MAIN DECK

U. S. Customs Admeasurement, Suez Canal Tonnage Rules of Navigation, and the Panama Canal Regulations.

The latest navigation equipment, instruments, and signaling apparatus are to be provided, including gyro compasses.

The main deck in the poop provides space for the crew's quarters, galley, dry stores, refrigerated stores, dry provisions, and steering gear. The poop deck houses additional crew quarters, officers' staterooms, ship's offices, officers' pantry and mess, and sick bay. The main deck in the midship house is arranged for two potable water tanks, each of 20-ton capacity, s.d. stores, canvas stores, clipping room, CO_2 room, battle dressing station, damage control office, laundry, and electrical stores and workshop. The bridge deck in the midship house provides for officers' staterooms and lounge, and captain's stateroom and office. The navigating bridge is located on the midship house and incloses the wheelhouse, radio room, and radar, and chart room. The forecastle accommodates a carpenter shop, armory clipping room, bos'un's stores, and resistor, and windlass rooms. The first and second platforms, which are located just below the forecastle deck, contain ample capacity for cargo stores and ammunition.

Each living space is ventilated, heated, and insulated to insure a comfortable temperature in all climates. All bulkheading in houses and quarters is of incombustible materials.

The ship's refrigerator spaces are insulated with mineral wool of the blanket type. The floors of the refrigerators are covered with 1½" mastic. The refrigeration system is operated by two compressors each of the multi-cylinder, single acting marine type using freon as a refrigerant.

The steering gear is of the Rapson slide, double ram, electro-hydraulic type. The gear is operated by two independent power plants, and is designed to provide independent operation of the rudder by either ram. Steering will be done by telemotor transmission.

The heating of living and working spaces is supplied by a steam generating plant of the self-contained packaged type with a normal capacity of 2500 lbs./hr., developing a steam pressure of 50 pounds per square inch for fuel oil heaters and oil heating coils, and a pressure of 35 pounds per square inch to the ship's heating and service system. These vessels are outfitted with a distilling plant, which consists of a packaged distiller and evaporator. The plant delivers 15 short tons per day at 2.5 gallons per minute.

A complete firemain system has been provided. This system is supplied by risers from the main fire pump, which is of the vertical centrifugal volute type, and delivers 450 gallons per minute at 100 pounds per square inch. The firemain is led fore and aft along the catwalk where exposed to the weather. All magazines are protected by sprinkling systems connected to the firemain. Fixed carbon dioxide smothering systems are installed to protect the after cargo pump room, inflammable stores, cargo hold, and cargo tank hatches. The firemain and fire-fighting equipment is designed to meet all requirements of the U. S. Coast Guard.

The liquid cargo system consists of three fore-and-aft deckmains; the port main will transfer aviation gasoline; the center main, motor gasoline; and the starboard main, diesel oil. These deck mains terminate in port and starboard loading and unloading connections at two stations. Each main has an electrically-driven cargo pump of the horizontal rotary type delivering 730 gallons per minute at 80 pounds per square inch. A pump room forward is provided for a fresh water cargo pump which operates a fresh water main to the aviation gasoline tanks, as the vessels also carry fresh water cargo when aviation gas is not carried. The fresh water pump is the vertical centrifugal volute type having a capacity of 700 gallons per minute.

The main propelling machinery consists of a single diesel engine driving the propeller shaft through a reduction gear and thrust bearing.

The main engine is an exhaust turbo supercharged diesel designed and built by Enterprise Engine and Foundry Co., San Francisco.

The reduction gear is designed to give a ratio of 2.586:1. The pinion and gear are of the single reduction double helical type.

The auxiliary diesel generators, port and starboard, are 240V-DC two wire type, and have a capacity of 250 kw.

Twenty tankers of similar design are being built for the British Merchant Fleet. These tank vessels are designated as design T1-M-BT2, 14 of which are being built by Todd-Houston Shipbuilding Corporation of Houston, Texas, and six by J. A. Jones Construction Co., Panama City, Florida, from the plans of Joslyn and Ryan, Naval Architects.

List of Vendors for BT-1

(List includes only main items and vendors known to date):

Main Engine: Enterprise Engineering & Foundry Co.

Main Cargo Pumps: Smith-Meeker Engineering Co.

Motors for Cargo Pumps: Electro Dynamic Works.

Line Shaft Bearings: United American Metals Corp.

Propeller: Baldwin Locomotive Works.

Emerg. Diesel Eng. & Gen.: Baldwin Locomotive Works.

Steam Generating Plant: Foster-Wheeler.

Evaporator and Distiller: Bell & Gossett Co.

Refrigeration Compressors: Carrier Corp.

Deck Winches: Sedgewick Machine Works, Inc.

Windlass & Warping Winch: Globe Hoist Co.

Fresh Water Cargo Pump: Dayton Dowd Pump Co.

Steering Gear: Baldwin Locomotive Works.

Binnacles and Compasses: Kelvin & Wilfred O. White Co.

Laundry Equipment: G. H. Bishop Co.
Grand Rapids Store Equip. Co.

Boat Davits: Welin Davit & Boat Corp.

CO_2 Systems: CO_2 Fire Equipment Co.

Gen. & Dist. Switchboard: Stirling Switchboard Mfg. Co.

I. C. Switchboard & Emerg. Swbd.: Zinsmeyer Co.

New Tuna Clippers

By K. M. Walker

The big steel-hulled diesel-powered tuna clipper Dominator, built by the Martinolich Shipbuilding Company of San Francisco, is expected to be the first of the modern steel clippers now under construction to enter service. Completed at San Francisco except for hold refrigeration, the vessel made the voyage to San Diego under her own power early in January, and after having ammonia piping and pumps installed left for the fishing banks in March.

Her dimensions are:

Length Overall	125′ 3	″
Length B. P.	124′ 0	″
Molded Beam	26′ 6¼	″
Beam Over Plating	26′ 7	″
Depth Molded	14′ 6	″

The hull up to the decks is built of welded steel with steel transverse bulkheads. Decks and deck houses are of wood. This is an all-brine refrigerated boat and all-brine wells are also of wood, calked and made watertight. Fuel is all carried in steel double-bottom tanks and in a steel tank under the bait boxes. Water is carried in tanks in the stern. Capacity of the fish holds will be approximately 275 tons, including bait tanks.

Main propelling power is supplied by an Enterprise diesel engine, 8-cylinder Model DMG-38, supercharged to deliver 800 hp. Auxiliary power consists of two Model E-50 Caterpillar diesels of 138 hp each direct connected to a 94-kva alternating current generator located in the lower engine room, and one Model E-54 Caterpillar diesel of 53 hp with V belt drive to a 50-kva alternating current generator. All current as generated is 3-phase, 60-cycle, 240-volts.

Refrigeration is provided by four 5″x5″ and one 4″x4″ York 2-cylinder ammonia compressors for fish hold refrigeration and one 3″x3″ York 2-cylinder compressor for the galley box.

This vessel has streamlined pilot house and bridge, with exhaust stacks and engine room ventilation system worked into the after end of the teardrop-shaped pilot house aft of the chart room.

The impression one gets on going on board this big clipper is one of spaciousness in every department. The engine room is particularly roomy, with large areas of floor plating and full room around all auxiliaries and pumps for access to all parts without crowding. The design of the piping is unusually clean and the usual maze of pipes is missing. This clean layout extends the full length in the wide shaft alley between the hold brine tanks, where the brine circulating pumps are located, and there is no clutter of piping anywhere. A heavy wood floor is laid in the alleyway over the line shaft, all parts of which are readily accessible at all times.

The crew is berthed in large airy rooms with plenty of floor space, and each man has a roomy individual locker. All crew accommodation is in the upper deck house except for the one berth located in the chart room aft of the wheel house on the bridge deck. The galley and messroom is also spacious and well laid out and is located in the after end of the main deck house.

This fine well-designed and completely modern vessel with her clean lines and compromise stern is a far cry from the days when Capt. Medina, the old man, first started fishing tuna off San Diego from a sailboat exclusively for the fertilizer plant. A bouquet for the designers and builders of the Dominator!





Close-up of incline, showing chains used and heavy construction of cradles.

LARGEST MARINE RAILWAY ON THE PACIFIC COAST

SATURDAY, DEC. 30, 1944, witnessed the official opening of the gigantic side-haul marine railway designed by the Crandall Dry Dock Engineers of Boston, Mass., and built at Commercial Iron Works, Portland, Oregon, for the U. S. Navy. Rear Admiral E. L. Cochrane, Chief of the Bureau of Ships, in company with other high-ranking officials, formally declared the project a complete success and announced that many big repair jobs were expected to be done on the railway in the near future. Dedicated on Labor Day, 1942, with impressive ceremonies, the railway has actually been in operation for more than two years, having handled nearly 300 dockings and undockings.

By Bruce F. Dean

On Washington's Birthday, 1943, the first of a long series of ships was launched from the railway, the ocean-going Navy tug USS Tawasa. Since then a stream of vessels have been built on the three transfer tracks, hauled onto the shunt area, and gracefully lowered into the Willamette River. Other vessels of many types have been brought up from the river for various sorts of repairs and once again sent on their way. Soon all new construction will cease on the railway, and it will be devoted exclusively to repair work.

The railway itself consists of three sections, the incline, the shunt area, and the transfer area. The incline, up and down which the ships are carried, consists of 12 pairs of steel tracks extending down into the river at a six-to-one grade. The tracks go down to 40 feet below mean low water level, and extend over 300 feet out from the headwall at the top of the incline. On these tracks are 12 cradles on wheels, so constructed that the top of the cradles is horizontal. When in position at the top of the incline, the level top of the cradles is flush with the cement apron of the shunt area which extends westward from the headwall for a distance of 315 feet. Some 2500 Douglas fir piles support this structure. These piles are all Wolmanized to prevent rot.

Ships up to 400 feet long can be lifted up the incline and thence



The incline, an LCS(L) on shunt an cradles at left. Two ships being repaired or overhauled on transfer tracks 1 and 2 at right.



The shunt area facing east from the gantry crane. Center foreground, part of a transfer carriage being changed in length. The left end of the shunt in left foreground is directly opposite the middle transfer track of the transfer area. At the river side are the 12 cradles of the marine railway, a ship up on six cradles at right.

moved onto the shunt area. This is the way it is done: a flat carriage, consisting mainly of joined I beams, is wheeled onto the tracks of a shunt on the shunt area. The shunt is a two-sided frame open at both ends to permit vessels' entrance and exit, the length of which depends upon the length of the ship to be handled. On the carriage, bilge blocks and keel blocks are positioned. The shunt is wheeled from the shunt area to tracks on the cradles and lowered into the river. The vessel to be repaired is then towed into position in the shunt, fixed firmly in its center by guy ropes, and the shunt is hauled up the incline.

Leaving the water, the ship settles firmly onto the blocks. The blocks can be moved out or in to insure perfect centering of the vessel on the carriage. Moved onto the shunt area, the shunt is placed directly in line with one of the transfer tracks in the transfer area to the north of the shunt area and transferred, still on the carriage, onto these tracks. There are three sets of these transfer tracks, each extending 275 feet in length.



View from gantry at southwest corner of railway. Left center are four LCS (L)s being built on transfer track No. 3, which temporarily (only for new construction) has been made into two sets of tracks. Tracks 1 and 2 also have ships under repair.

Here most of the repair work is done, since three ships at a time can be handled here. Work can, of course, also be done on the shunt area or even when the ship has not left the cradles at the top of the incline. There are two shunts in use, so that while one is disgorging a ship onto the transfer tracks, the other may be going down the incline to release or receive another vessel. Two-way simultaneous motion on the incline, however, is not possible.

Three electric motors of 200 hp under the apron near the headwall furnish power for the chains which raise and lower the cradles. The chain consists of 6000 feet of pin and link type, with smaller additional link chains picking up the slack. Power for movements on the shunt area and transfers is provided by a donkey engine which pulls cables rigged with blocks and tackles and attached to the carriages. The power house for the incline movements is located at the north end of the headwall. There are 12 contactors, one for each set of tracks, so that it is possible to move one or any number of cradles up or down. Each motor takes care of four cradles, and one, two or all three motors may operate at a time.

Magnetic clutches and brakes act as a safety device in the operation of the railway. When the clutch is in, the brakes are automatically off. When the brakes are applied, the clutch is automatically out. Electric power is necessary to keep the brakes off, so that in the event of a breakdown or failure of power, the brakes automatically stop all movement of the chain. In addition, to prevent the up-coming cradles from hitting the headwall, limit switches at the top of the incline automatically cut off the power just before the cradles reach the headwall. For raising the cradles there are five different speeds, and three for lowering. The operator at the controls works by visual as well as telephonic signals and has an excellent view of the shunt area and the incline and river.

Facilities are available anywhere on the shunt and transfer areas for lifting as much as 12 tons at a time, and at the west end, extending the whole width of the shunt area and alongside transfer track number three, are tracks supporting a 36-ton traveling gantry crane.

The base of the shunt, which is of extremely strong construction, can itself be used for raising or lowering a ship without the necessity of the transfer carriage being used, the blocks being placed directly on the base. Three ships, on carriages, can be repaired on the transfer tracks at the same time, while two more, still in the shunts—on the shunt area or on the incline at the headwall—are undergoing repair.

In connection with the marine railway, Commercial Iron also operates the only sludge barge in the Columbia area. Operating on the vacuum pump principle, this barge is used up and down the river for removing sludge and gas and for cleaning ship tanks. Built and launched at CIW, it has already seen much service.

The railway itself has handled almost 300 dockings and undockings to date. In 1944 alone over 260 such movements were taken care of. Many vessels need only a new paint job, others come in for a more extensive overhaul, while still others require serious and complicated repairs. It is expected that when new ship construction ceases on the railway, repair work there will really come into its own.

Emergency Gas Pipes on Western Front

You've heard of the Red Ball Express and the White Ball Express operating on the Western front.

But have you heard about the "Pipe Line Express"?

With roads under fire, bombed-out bridges, and rough terrain to cross, getting vital gasoline and oil to the flying fields and mechanized units was a job for unsung heroes.

Pipe lines were the only way out, and 90 per cent of all the gasoline reaching the front is piped there—not through pipelines as we know them under peacetime conditions, but through lightweight lines easily handled and more easily assembled. Installing normal four-inch, 28-ton-per-mile pipe, using screwed or flanged connectors, is a twelve- to sixteen-mile-a-day job. But in battle areas under abnormal conditions this normal speed was much too slow.

With special wartime materials and Army crews trained in Louisiana, 30 to 40 miles of pipe lines were slapped together every day.

How? First, by using pipe of thin steel plate, half the normal weight. Second, each pipe end was machined for use with demountable couplings and specially constructed gaskets, permitting the joining of sections of pipe with a few deft turns of a wrench. Nobody wants to be carefully lining up pipe for screwed connections or tightening flange bolts with shells flying around. Third, the accessory pipe line equipment, including storage tanks and pumps as well as pipe, was redesigned and lightened so it could be moved quickly and easily in most any lightweight vehicle that might be at hand. Fourth, pipe lines were laid above ground, the front being no place for ditch digging—foxholes are more important.

Plans for the system were worked out by Army engineers, oil experts, Crane Co., and other valve and fitting manufacturers coordinating valves, pipe, pipe connectors, and pumps into one readily-assembled unit.

Crane Co. designed and installed special equipment to speed production and meet the Army deadline for its share of the assignment to furnish valves and machine pipe ends.

Thus an 800 mile "Pipe Line Express" was made ready for service with a speed unequaled in transportation history—an express that delivered 1,500,000 gallons of gasoline a day even in the early stages of the invasion of Europe.



Upper left: Valves for the "Pipe Line Express" on loading dock of Crane Co., Chicago, Ill. These valves will soon be a part of more "Express Lines" delivering oil and gas to the fast-moving battle fronts of our fighting forces.

Upper right: Dockside pumping unit installed and operated by Engineer Petroleum Distribution Unit. This installation is typical of overseas methods of unloading fuel direct from ships to shore storage tanks.

Lower left: T/5 Leonard J. Heggestad, Storbuck, Minn., and Pvt. Leonard C. Van Gemert, Braintree, Mass., both of the Eng. Petroleum Distributing Co., couple pipe line behind stringers. It is possible under normal operations to couple eight miles of pipe per day.

Lower right: Trestle bridges such as shown are built over rough country to carry the pipeline which feeds gas and oil to the front line troops in France.

(Signal Corps photos)

Casting Steel Anchor Chain

ON THE DESERT

Text and Illustrations by N. Duke Lanfre





In August of 1942 patriotic T businessmen believed their comm nity should participate in the v effort in some major way. With t in view they formed the Taft Al Steel Company, known as "Tasc a 100 per cent community sponso and owned concern. They convert a long-dormant gray iron foundry the outskirts of the city into a mo ern electric steel casting plant.

Needless to say, the desire to p such an enterprise into operation m with numerous difficulties, both fro the standpoint of procuring t equipment and securing the perso nel from an industry that was th badly under-supplied with skill men. War production officials in t Pacific Coast offices informed the men that while they were 100 p cent in favor, they were unable issue priorities due to the scarciti of material then existing in the n tion.

Representatives were sent from th Western city to the East, where use equipment was gathered from vario localities and shipped to the Pacif Coast. This equipment was asser bled by green, untrained labor ar supplemented with homemade equi ment constructed from used oil fie material.

At the suggestion of the Maritim Commission, and due to the shortag of anchor chain, "Tasco" announce its intention of going into the manu facture of cast steel chain, a proce that is technically difficult but highl important in the Nation's defense pi ture.

After numerous disappointmen and costly experiences this grou succeeded in mastering the techniqu and on July 1, 1944, turned out the first carload of cast steel anchc chain. This type of casting is pa

Top of page: Oilfield scrap is used almost exclusively for melting purposes. Alloys are added to bring the steel to the required tensile strength.

Bottom: Women employ hand molding pouring cups from core sand to be used in the pouring operation.



Women core machine operators making connecting link cores.



View of the set-up table, showing the cores being placed by women operators. The single links connecting these cores have already been put in place.



From the casting tables the connected chain is carried to the tumbling barrel, where it is cleaned. The two operators in this photo are one-armed.



Upper left: From the tumbling barrel the chain goes to the Cleaning Room, where the first operation is cutting the heads off the connecting links with acetylene torch.

Upper right: As the chain passes down the conveyor line the cut is ground and finished by swing grinders.

Lower left: Additional hand-grinding is necessary to finish the links in perfect shape.

Lower right: All anchor chain must conform to the winch manufacturers' specifications. Six links are delivered for testing purposes by the vendor.

ticularly hazardous in foundry practice, due to the fact that each link represents a test bar, whereas in jobbing foundry practice a 5000-pound casting may be poured with only one test bar necessary.

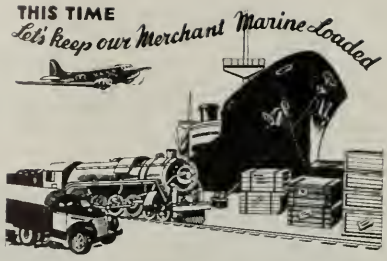
American Bureau of Shipping rules and regulations specify that every 18 months the ship's chain must be laid on the docks for calibration. If the examination discloses that the diameter of the link has worn to a certain limit, the chain is then subjected to a pull test, and if it breaks it must be replaced with a new chain.

"Tasco" recently completed the installation of a new chain-testing machine with a capacity of one million pounds, and now offers 24-hour service to the San Francisco and Wilmington waterfronts, either for testing purposes or chain sales.

The organizer and "spark plug" behind this new industry is M. S. (Dick) White, a former Ford dealer of the city of Taft, who is directing the present company. Taft Alloy Steel Company feels that industry has come to the West to stay, and that there will be a brisk business in the future for alloy steel castings. Approximately 200 personnel (25 per cent women) are employed in the foundry.

Pacific WORLD TRADE

By T. Douglas MacMullen



Cartels

Have They a Place in World Trade?

By Dr. Cecil L. Dunn
Acting Chairman, Department of Economics and Sociology, Occidental College

There is a tendency in the United States to attempt to gloss over the whole situation in the Nation and in the world by saying we are in favor of free enterprise, but no mumbled incantation can lead us to that end.

Free Enterprise is a state of affairs which can only be secured by bearing down and working long and hard.

The cartel is, in my opinion, one of the most serious obstacles to freedom of trade.

A definition of the cartel is a rather difficult thing to achieve. They have been with us for 70 years or more and, in that length of time, there have been a great many different descriptions.

I believe, however, that it is desirable to begin by saying that the cartel is essentially a device to minimize business risks, and that it is typically a device for controlling capacity and attempting to control markets and market conditions.

Risks are especially dangerous, of course, in those heavily capitalized, high-fixed cost industries, which experience difficulty in adjusting themselves to price fluctuations.

The cartel, therefore, has tended to appear primarily among those industries and to be a method of interbusiness cooperation.

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More on Rubber



Dr. Cecil L. Dunn

The cartel has taken many forms and perhaps, if we consider some of them, a final definition may be easier. There is, in the first place, that type of the cartel which provides for interfirm agreements for restriction of capacity or output.

The ultimate objective of such restriction is to prevent the overexpansion of the capacity of a given industry, and thereby to protect the cost levels of its firms.

The second type of the cartel is that which provides for the adjustment of sales quotas, to assure to all of the participating members a sales quota which they can reasonably at-

(Continued on page 228)

"The seas are but a highway between the doorways of the nations."
—*Franklin Knight Lane*

Rubber

It Influences Trade and Shipping Throughout the World

Rubber is a world trade commodity. It is one of our most vital imports, for without it a large part of our trade with the Orient would never have been possible, while as an export item it is usually thought of only in connection with automobiles and tire distribution. But that is hardly the whole story.

When Dr. Benjamin Franklin Goodrich founded his company in Akron, Ohio, in 1870, he could scarcely have foreseen that research, vision and sacrifice would have such a far-reaching effect on his country's war success as certain rubber products have made possible. For instance, the airplane de-icer, the barrage balloons, rubber life rafts, and life-saving suits, as well as tire production and the vast synthetic program. When he furnished the pneumatic tires for Alexander Winton's first passenger car sold in the United States, he may have foreseen that tires would be exported, but it was impossible for him to have foreseen that in 1945 his company would be setting up headquarters in San Francisco for its International Division where more than 32,000 products in 1000 distinct lines would be prepared to play an important role in world commerce, and its goods shipped to every part of the globe.

When "synthetic" became the word for rubber early in the war, the world wondered what the future might hold for the industry. The world still wonders, but with the basic trends becoming more apparent, definite plans are being made. In its recent "analysis of changing factors in the world's rubber supply



John L. Collyer
President, B. F. Goodrich Company. Mr. Collyer has just been appointed rubber czar, the spot made famous by William Jeffers. (Meet another important Goodrich man on page 225.)

situation" the Goodrich people bring the chart of the future up to date.

The Japanese captured the areas which normally supplied 90 per cent of the world's natural rubber, but industry, science and government have teamed to provide a vast tonnage of American-made synthetic rubber to speed the United Nations' progress in a war that would have been lost but for this achievement.

We spent $750,000,000 for facilities to produce American-made synthetic rubber because we were up against the hard fact of an almost complete shut-off of natural rubber within a few weeks after Pearl Harbor.

Practical capacity of the plants will approximate 1,000,000 long tons a year.

Here is how the operation of the United States Government's production of synthetic rubber was divided between operating companies as of May, 1944:

Company	Location	Annual Capacity Long Tons
Copolymer Corp.	Baton Rouge, La.	30,000
Total		30,000
Firestone	Akron, Ohio	30,000
"	Lake Charles, La.	60,000
"	Port Neches, Texas	60,000
Total		150,000
General Tire	Baytown, Texas	30,000
Total		30,000
B. F. Goodrich	Louisville, Ky.	60,000
" "	Borger, Texas	45,000
" "	Port Neches, Texas	60,000
Total		165,000
Goodyear	Akron, Ohio	30,000
"	Houston, Texas	60,000
"	Los Angeles, Calif.	60,000
Total		150,000
National Synthetic Rubber Corp.	Louisville, Ky.	30,000
Total		30,000
U. S. Rubber	Los Angeles, Calif.	30,000
" "	Naugatuck, Conn.	30,000
" "	Institute, W. Va.	90,000
Total		150,000
Total Rated Annual Capacity		
GRS (All Production Listed Above)		705,000
Butyl (Standard Oil, La.—Humble)		75,000
Neoprene (duPont)		40,000
Total Synthetic Capacity		820,000

The above figures are rated capacities. Actual production of these plants may exceed 1,000,000 tons a year. Output of privately-owned American plants and of foreign plants will raise the world total to about 1,200,000 tons annually.

John T. Staker
Pacific Coast Manager of the International Division, B. F. Goodrich Company.



Pacific WORLD TRADE

Add to that capacity this estimated potential post-war natural rubber capacity:

Crude Rubber	
British Malaya	620,000 Tons
Netherlands Indies	620,000
Ceylon	100,000
India	17,000
Burma	13,000
British North Borneo	20,000
Sarawak	42,000
Thailand	47,000
French Indo China	64,000
Liberia	16,000
Other Africa	12,000
South and Central America (Excl. Guayule)	20,000
Guayule—Mexico	7,000
Guayule—U. S. A.	1,000
Cryptostegia	1,000
Total World Natural Rubber	1,600,000

Thus the after-the-war annual potential rubber production of the world should be 2,800,000 tons.

That is more than twice as much rubber as the entire world used in the highest year on record—1941—when estimated world consumption was 1,300,000 tons.

But improved plants and processes might make the present facilities obsolete. Their value hinges upon the day-to-day progress of our scientists and men of industry in increasing the utility of synthetic rubber and in reducing its cost.

For the large tonnage uses, natural rubber today has the advantage.

But here, for example, is what happened to market prices per pound of three basic materials over a 25-year period:

	1918	1928	1935	1943
Aluminum	33c	24c	22c	14c
Magnesium	$1.81	55c	30c	20½c
Rayon (Yarn)	4.77*	1.50	57c	55c

(*1919)

Synthetic rubber costs are following a similar pattern and no one can tell today what results will have been achieved by the time hostilities have ended and governmental controls are no longer required as wartime measures.

This is an **unknown** today.

The magnitude of our synthetic rubber production may depend not only upon technological advances but upon the policies which the American people, through their government, adopt for the disposal of our existing government-owned synthetic rubber plants.

This is an **unknown** today.

The peoples of the other nations who have a large stake in the production of natural rubber cannot plan soundly now for long-term development of their plantations.

Our progress in synthetic rubber may be a major factor in determining to what extent large-scale plantation operation will, in the long run, prove economically profitable.

This is an **unknown** today.

For many years, rubber has been America's No. 1 import in terms of dollars.

Its post-war position in international trade will be affected by whatever action is taken by the nations of the world to reorganize international trade.

This is an **unknown** today.

In the opinion of Goodrich, the American people will require that a minimum annual production of 200,000 tons of American synthetic rubber be maintained, regardless of economic factors, purely as a national defense measure, just as arsenals, naval bases and air bases are maintained. How this insurance can best be provided in the future is yet to be determined by our people. The decision undoubtedly will exert an influence on the world rubber situation.

This is an **unknown** today.

But certain facts **are** known today and certain developments may occur in the reasonably near future.

The United Nations in the coming months may gain access to major natural rubber-growing areas—**while the war is still on.**

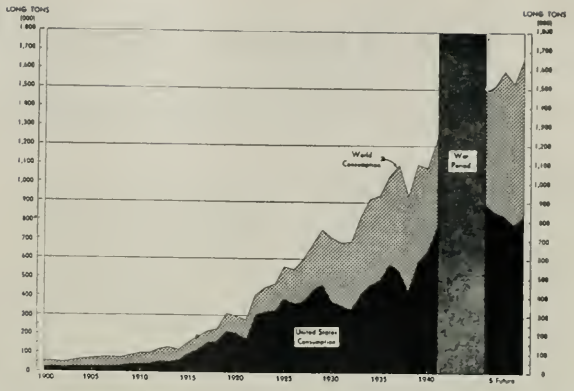
The trend of war in the Southwest Pacific indicates recapture of Borneo, Java, Sumatra, perhaps even the Malay Peninsula, before the final defeat of Japan.

The United Nations would thus be able to resume natural rubber production and supply from these areas.

Even if the rubber-growing areas of the distant East are reoccupied, the probability is that **it will take at least two years before** normal operations are restored.

While there may have been no important destruction of rubber trees, because, knowing our accomplishments with synthetic rubber, the Japanese will have little reason to destroy the trees, the plantations have probably been neglected.

(Continued on page 231)



The part United States demands play in world rubber supply.

A Goodrich export item (the umbrella) made of Koroseal.



Los Angeles Again Steps Out

In Its World Trade Program

Preliminary negotiations have been completed for establishment of reciprocal trade development relations between the Los Angeles Chamber of Commerce and 12 national and local chambers of commerce in nine Latin American nations, the Los Angeles chamber has revealed.

W. S. Rosecrans, a director and past-president of the chamber, announced start of the hemispheric trade development project at a meeting of the chamber's world trade committee, following a two-month tour of Latin America with Justin F. Gleichauf, foreign trade analyst and



W. S. Rosecrans

market research expert on the staff of the chamber.

The new program, Mr. Rosecrans said, in effect means that the staffs of the 12 Latin American chambers of commerce will serve as representatives of the Los Angeles chamber in a vast plan for trade development, and that the staff of the Los Angeles chamber, in turn, will be at the disposal of the Latin American chambers in their trade promotion.

One of the most important phases of the project will be the interchange of information based upon economic surveys in the various nations, with special analyses of sources of raw materials, production, demand, sales methods, consumer interest and governmental policies affecting inter-American commerce.

The nine Latin American countries which will cooperate in this program are Panama, Peru, Chile, Argentina, Brazil, Uruguay, Venezuela, Colombia and Cuba.

Mr. Rosecrans declared that there were great opportunities for the development of trade between Southern California and Latin America, despite some unfavorable factors, but that successful building of this trade will require careful and hard work He listed 7 factors favoring post-war trade between Southern California and Latin America, as follows:

"(1) There is a real interest in

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Pan-Americanism in every country. This interest is both economic and political, without a trace of emotional influence.

"(2) The Good Neighbor policy has broken old cultural and commercial ties with Europe and turned the eyes of students and younger businessmen to the United States.

"(3) Latin America will not need loans after the war to buy American goods. Huge dollar balances are waiting to be used when the war ends.

"(4) The United States, with its gigantic industrial capacity, will be in a better position than any other nation to supply Latin America with needed goods.

"(5) Reintroduction of plentiful supplies of low-priced American goods should help to stem serious inflation in all Latin American nations.

"(6) Articles produced under wartime conditions are creating an intense desire for quality products from the United States.

"(7) New channels of distribution are being opened in Latin America by American citizens and Latin Americans who have been trained in the United States. Owners of these outlets are used to and prefer to handle American-made goods."

Unfavorable factors affecting trade between Southern California and Latin America were listed by him as follows:

"(1) There is too much governmental interference by both United States and Latin American administrations.

"(2) Imposition of war regulations has hampered efficient functioning of consular offices, both United States and Latin American.

"(3) Foreign exchange control, import licensing and blocked currencies in Latin America can frustrate planning and trade development carried on by businessmen.

"(4) There is a lack of adequate ocean freight service to and from the West Coast of the United States.

"(5) The West Coast has unfavorable freight rates as compared with East Coast and Gulf ports.

"(6) The West Coast of the United States faces stiff competition from the

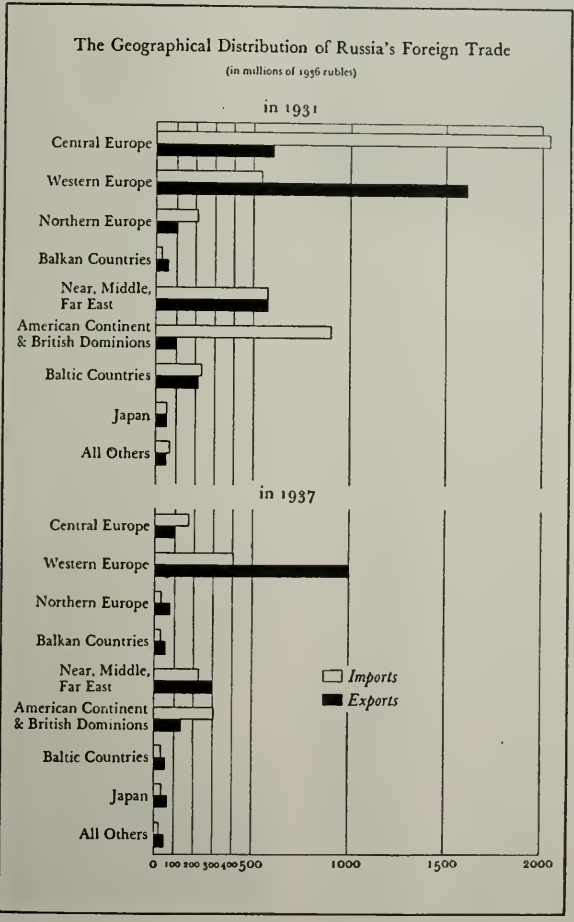
(Continued on page 231)

Justin F. Gleichauf



Russia—
A Post-War Trade Problem

The "problem" of post-war trade with Russia has several factors. One is the peculiarity of the governmental set-up, which confines all foreign trade dealings to its own agencies. Another is the magnitude of the financial phase. Another is in the probability that Russian imports will very far exceed exports. And finally the socio-political tinge that colors so many of Russia's activities. With this last factor we will not deal here.

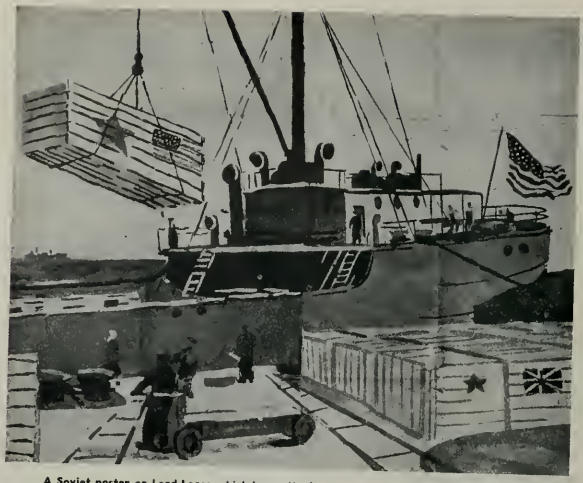


Since April, 1918, foreign trade has, by special decree, been a monopoly of the State in Russia, and there is no present justification for expecting any change. In collaboration with planning and financial agencies, the Commissariat of Foreign Trade prepares an export-import plan, directs the execution of this plan, and manages the customs.

So-called combines, or export and import corporations, constitute a network of operating organs of the Commissariat of Foreign Trade. Each of these combines deals with a specific line of commodities. Thus, one exports all types of coal; another exports raw, dressed and manufactured furs; another handles herbs, drugs and tobacco; and so on. Some of the combines are engaged in the import of goods of a certain type, while the others are both export and import organizations. For instance, the one that exports books and office supplies also imports a similar line.

Then there are agencies that deal with regional trade. To this group belong the Soviet-Sinkiang Trading Corporation, a similar one for trade with Afghanistan; and still others located outside of the country where the foreign trade department is represented by "Torgpreds" (trade delegations), which form an integral part of the respective diplomatic missions. From this word "Torgpred" comes the word "Amtorg," which is the unit operating in America. This organizational set-up is supplemented by other special bureaus for shipping, marine insurance, etc.

Obviously all dealings, whether buying or selling, must be with the proper agency of the Government,



A Soviet poster on Lend-Leose which bears the legend, "Greetings to the brave soilors of the United Stotes ond Great Britain who fight the Fascist pirotes and bring through the goods!"

which thus permits the overall planning of financing and of production.

The financial phase of Russian trade has not yet been worked out for the post-war period. The Bretton Woods Monetary Conference found the Russian financing to be one of its major problems, and Congressional approval also may hinge on the Russian participation. Since the last war, Russia had great difficulty in obtaining long-term money credits until United States recognition in 1934, and had most of its foreign purchases guaranteed by Germany. After recognition, several countries made substantial loans against which imports into Russia were charged, which practically put the country on a cash basis. Then the present war brought about the Lend-Lease deal which Russia is hoping to have extended to cover rehabilitation after the war. If Lend-Lease is not extended to cover post-war financing, and if the Bretton Woods Monetary Agreement fails of approval in Congress, there will still be three ways open. One is the Bretton Woods International Bank proposal, which is more likely to be approved. Another is private loans from American banks, and the third is credit sales on a long-term basis. The question of loans to Russia has been often debated, but the Johnson Act, which prohibits loans to defaulting countries, has been construed as applying to Russia, although the only outstanding obligations are the pre-revolution loans, which the present government disavows. The present government has been meticulous in all its financial dealings with foreign shippers, whether public or private.

The "balance of trade" constitutes the final problematic factor. Russian imports in the past have very far exceeded exports and the exports have been steadily declining in volume and in comparison with gross production. Switzerland, with a population of only 4,200,000, had in 1938 a larger share of world exports (1.4%) than did Russia (1.3%), with a population of 170,000,000. In 1930, exports amounted to 3½% of Russian production; by 1936 they had dropped below 1%, and the table showing import and export totals indicates for 1939 an export figure of $25,000,000 against an import figure of $56,000,000, and there has been no year since 1909 when Russia's exports approached the import total. Not because they do not want to export but because they have never been able to produce a sufficient surplus. Eric Johnston quotes Stalin to the effect that Russia would like to export in larger quantities, but needs the productive equipment in order to do so.

Obviously there must be a means whereby a country can pay for its purchases, or it cannot purchase. In Russia's case there are many commodities which the United States does not import, but which neighbor countries to Russia do import and those countries in turn can export to us, or to countries that do export to us. Somewhere along the line there would be either dollar exchange available or exportable products. Russia is talking in terms of billions of dollars, estimating that the United States could sell her an annual total of $350,000,000, and it is extremely unlikely that Russia's furs, fish, chemicals, lumber and minerals could pay for any such total. One means of paying, of course, is gold, of which Russia has a great deal, both above and below the ground. In fact, mining is one of the industries for which machinery is wanted, along with oil equipment for drilling and refining, electrical manufactures, steel, chemicals, railroad equipment, ships —and technicians to operate all of them and to instruct their people.

It was the richest part of Russia both agriculturally and industrially that was invaded, and the industrial equipment of all kinds was either destroyed or taken away by the Germans. Russia's first problem is to replace it, then to rebuild, and then to expand its industrial production.

In a computation that has been made in other countries, particularly China, it is said that if the per capita income of the country could be raised by $10.00 a year and if $1.00 should find its way to the United States in the purchase of greater living comforts, our exports

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The "Provdo" printing plant in Moscow.



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Exporting Heavy Machinery

By P. A. Hoyt
Executive vice president, Oliver United Filters, Inc., Oakland.

Oliver United Filters, Inc., is recognized as the largest individual manufacturer of industrial filters and filtration equipment in the world, and has an export trade that extends to virtually every country on the map.



P. A. Hoyt

It is to be expected that the cessation of hostilities will create an unprecedented demand for export shipment of goods from the U. S. A. to all quarters of the globe, and in consequence many manufacturers and purchasers will find themselves confronted with shipping and packing problems not previously within the range of their experience.

The fact that a piece of equipment has proved satisfactory for normal export requirements does not mean that it can safely be specified for all conditions that might be encountered in any country of export nor that normal export packing and protective measures are necessarily adequate.

For example, motors of a given hp and vacuum pumps or compressors of a given rated displacement may be adequate for normal operating conditions but worthless for the same service at higher altitudes.

Types of motors suitable for service in temperate zones are usually unsuitable for conditions encountered in the tropics.

Lubricating requirements vary materially in accordance with geographic locations. Geographic location also has a very direct bearing on the type of protective measures used to insure against damage and depredations during transit.

Transportation and handling facilities between the port of debarkation and ultimate destination play a very important part in determining the type of packing and dimensions of packages that can safely be used.



Operating and erection instructions normally suitable for skilled mechanics and operators are usually entirely unsuitable for use in countries largely dependent on peon or native labor, and in many instances have to be materially amplified and also translated into the particular language spoken in the country of destination.

These and many other allied factors render it almost imperative that exporters study and acquire a very complete knowledge and experience of conditions obtaining in the country and locality of export.

Purchasers of equipment for export can best safeguard their interests by dealing with suppliers who have acquired a wide experience along these lines.

We are continually encountering and solving export packing and shipping problems of an unusual nature. Filtration equipment has been manufactured and shipped for operation under temperature conditions encountered between the Arctic Circle and the Equator and altitudes ranging from 15,000 feet above sea level to 1200 feet below sea level, and in addition to having to solve the mechanical and physical operating problems encountered under such a wide range of temperatures and atmospheric pressure, we have also had interesting packing experiences in equipment to accommodate the often meager and primitive transportation facilities available.

Our filters and equipment for the most part fall within the classification of heavy machinery weighing several thousands of pounds, and in addition to normal shipment by truck, rail, steamer, and sea train, our export packing experience covers sectionalizing for shipment by airplane, dog sled, mule back, llama back, elephant back and even coolie back.

We have not as yet been called upon to pack our equipment for shipment by submarines or rocket planes, but such contingencies are by no means unlikely in the post-war world.

Perhaps one of the most interesting packing problems encountered is that of shipment by llama back, which with rare exceptions restricts the gross weight of individual packing boxes to a maximum of 100 pounds.

We recall one such problem involving the shipment of a large metallurgical filter 11 ft. 6 in. in diameter by 12 ft. long, together with its

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Converting China's Potential

By William L. Montgomery
Managing Director
San Francisco Bay Regional Board
China-America Council of Commerce & Industry, Inc.

An engineer will tell you that no matter how large a figure one starts with, if he multiplies that figure by zero the result is zero. Pessimists would have one believe that granted that China does have a population of 450 millions, the purchasing power is so low that the trade possibilities are practically nil. On the other hand an optimist surveying China's agricultural needs might come up with a figure of 200,000 tractors as China's potential of absorption of just one item of farm equipment. Perhaps the truth of the China market is between these extremes.

Businessmen are quick to ask how a transaction is to be financed. Many people are surprised to learn that China has 300 millions of dollars, U. S., in gold even now in the United States, and that 22 millions of dollars of credits extended have not been drawn upon by China. Further, that the $25,000,000 tung oil loan granted China in 1938 was repaid two and one-half years before maturity; and that China has already repaid, to the extent she had drawn on them, the $50,000,000 stabilization loan and the 5,000,000 pounds sterling loan granted during wartime. And that China is faithfully meeting her financial commitments elsewhere. Witness the $2,000,000 tea-brick shipment recently to the Soviet Union in liquidation of China-Russia barter transactions.

China's prewar foreign trade totaled more than $200,000,000 annually. Given the same conditions after the war as prevailed before the war, August Maffry, Chief, International Economics and Statistics,



William L. Montgomery

Bureau of Foreign and Domestic Commerce, Washington, D. C., recently in San Francisco, reported post-war estimates of our own foreign trade potentials tripling or quadrupling the pre-war figures within a reasonable time after the war. China will benefit from United States and other world demands for her products. Should these demands result in the increase in China's trade as forecast for the United States foreign trade, China's post-war trade could reach to $600,000,00 or even $800,000,000 annually. Any figure even approaching this value would support sizable credits required for China's industrialization.

China's commodities of interest to United States industry include tungsten, antimony, tin, tung oil, furs, hides, skins, sausage casings, hog bristles, to name a few. These can be exchanged for a growing volume of American exports to China.

San Francisco bankers, serving as a sub-group of the Water Transportation Committee of the China-America Council of Commerce and Industry, Inc., heading up in San Francisco under Dr. Henry F. Grady, President, American President Lines, have given study to China's indicated requirements for transportation and tele-communications. These bankers have reported their willingness to finance their customers' trade with China on usual commercial credit terms. On capital-goods purchases, equipment with long life, these bankers have indicated willingness to participate in long-term credits underwritten by the Export-Import Bank of Washington. Interest has also been expressed in participating with a syndicate of banks in financing large purchases by China.

China has submitted schedules of post-war requirements totaling 10,000,000 tons with an estimated value of more than two billions of dollars. Of this total, China is requesting UNRRA to supply 37 per cent in value. The other portion China proposes to finance by exports, by credits mobilized by the Government, and by internal financing. Transportation and tele-communications requirements, as submitted by China, alone total close to 400,000,000 tons with an estimated cost of $663,000,000. These requirements have been studied by Committees of the China-America Council of Commerce and Industry from the viewpoints of reasonableness of the overall program, of the possibility of supply, and possibility of finance. Committee reports provide the basis for future, actual negotiations of business.

San Francisco bankers have observed that if conditions in China could be made comparable to those in the United States that purchases could be funded by equipment trusts. These are considered in the United States as top-notch investments. Then, too, it is remarked that given conditions for foreign investments as attractive to risk capital as may be available elsewhere abroad, the industrialization of China could be perhaps best speeded by introduction of venture capital.

Working with the China-America Council of Commerce and Industry, Inc., in the United States is a group of 40 and more Chinese Government experts. Through these experts this Council advances suggestions which would help provide the desired economic climate for this venture capital.

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Over a period of two years engineers, headed by Alex Taub, formerly Chief Engineer, Foreign Economic Administration, now attached as consultant to the China-America Council, developed a Guide for China's industrialization. Checked with industries in the United States and submitted to China for suggestions or modifications, this Guide covers, outside of transportation, 104 separate industries calling for 600 plants of minimum efficient size yet of economic importance by China's standards, to be established over a five- to seven-year period, with an investment of $800,000,000. This is a story in itself; and space suffices only to say that this Guide and its development into realization is being handled by the Light and Heavy Industries Committee of the China-America Council of Commerce and Industry, Inc., with Mr. Taub as consultant.

Other China-America Council work to convert China's potentialities to realities covers fostering of imports, development of grades and standards of quality and condition of goods to be imported into the United States in exchange for exports. Now that the United States has relinquished extraterritorial rights in China, American business is now subject to Chinese laws. The Legislative Committee of the China-America Council is studying these laws, so that American business may be properly advised as to procedures for registration of companies, and on other questions relating to trademarks, patents and copyrights, and other phases of China trade, industry and finance.

China, it is pointed out, realizes that her program of post-war industrialization requires the help of foreign capital. To bring this about the Chinese Government has taken a number of steps to ease restrictions on foreign investments. Leading Chinese officials have pledged that China will do everything possible to facilitate and protect American as well as Chinese interests in building up a two-way trade. The Council has been assured by spokesmen for the Chinese Government that laws on foreign trade and investment will be revised on liberal principles and in line with modern commercial practices on the basis of free enterprise.



Stanley W. Caywood
Chairman, Heavy and Light Industries Committee of China American Council. Mr. Caywood is general manager, International Division, B. F. Goodrich Company.

Post-war industrialization of China, as visualized by Chinese leaders from the time of Dr. Sun Yat-sen, implies for both China and the United States boundless opportunities for two-way trade. This is the opinion of America's industrial and business leaders, who for many months have been working through the China-America Council of Commerce and Industry to establish a solid foundation for a flourishing, reciprocal trade between the two countries.

The Council is an association of business and industrial concerns formed to develop commercial and financial relations between China and the United States. Its membership now includes firms in more than 50 lines of business, representing practically all of the major industries interested in post-war trade with China.

The Council is headed by W. Gibson Carey, Jr., of New York City, as president. Mr. Carey is president of Yale and Towne Manufacturing Company and is a former president of the United States Chamber of Commerce. Cyrus S. Ching, vice president of the United States Rubber Company, is chairman of the Board of Directors.

The Council's primary objectives are to stimulate conditions which will encourage direct investments in China by American industry and to develop trade opportunities which will enable American business to begin meeting China's requirements as soon as reconversion gets under way in this country and China is opened up to world commerce. Assisting China to build up her industries and develop her natural resources, the Council believes, would greatly benefit American business as well as the Chinese people, comprising one-fifth of the world's population. This in turn would be a potent factor in the consolidation of world peace.

Recognizing that the Pacific Coast will assume ever-increasing importance in our trade relations with China, the China-America Council of Commerce and Industry, Inc., has centered much of its activities in that area. Strong regional committees have been formed, with Henry D. Collier, president of the Standard Oil Company of California, as chairman of the San Francisco Bay Regional Board; Charles Kendrick, president of Schlage Lock Company, as vice chairman of the San Francisco Board; Paul B. McKee, president of the Portland Gas & Coke Company, chairman of the Portland Committee; and John Philip Herber, president of Grays Harbor Exportation Company, chairman of the Seattle group.

The Council is an organization that means business, and is already accomplishing a great deal in spite of war handicaps.

Chinatowns in U. S. cities have been the tie between the nations in the public mind. Now China's future is of industrial importance to all our people.



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Harbor Facilities
And Their Relation to World Trade

By Mark H. Gates
Secretary, Board of State Harbor Commissioners, San Francisco.

There are many who, when thinking of the transportation of goods, see only the ship sailing the seas, the freight train speeding over the rails, or the truck rolling along the highway. They lose sight of facilities and services that must be provided and performed at the various terminals. Without these the steamship companies could not operate, and world trade could not be carried on. For instance, few realize the important part that port facilities play in world trade in the transportation of commodities by water.

When a ship arrives at a port to load or discharge cargo—and it usually does both—it is essential that these operations be performed in the shortest possible time. It is only when the ship's screw is turning—when the ship is proceeding to some destination—that it is making money. While in port its overhead expense is still going on and in addition it is faced with the costs of handling the cargo to and from the ship. So, under the circumstances, the ship operators desire and expect a quick



Mark H. Gates

"turnaround" and they look to the port operators to provide the facilities, and in some instances the services, that will bring this about.

A major part of these facilities is provided by the public ports under the direction of Harbor Boards, for peacetime trade, and they also become an indispensable adjunct to wartime operations. These facilities, constructed and maintained over the years by the Harbor Boards, were immediately available as going concerns to the armed forces at the outbreak of the present conflict for the shipment of the tremendous quantities of material and the millions of personnel to the far-flung overseas battlefronts.

The average shipper gives little thought to the multiplicity of facilities and services that are required for the proper functioning of a modern port. The piers must be large enough in area and substantial enough to hold the ship against the tide and the wind and to support the weight of thousands of tons of cargo. Special facilities for handling passengers and baggage are also necessary. In addition to the piers, many wharves and buildings are required for storage of merchandise and equipment, repair shops and offices. Provision must be made for handling special commodities such as oil, lumber, grain and fish, and there must be refrigeration and fumigation facilities, marine railways and ferry slips. Streets must be maintained for trucks, and in most ports a belt railroad which is connected with the

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Largest of San Francisco's fifty-odd piers, showing roll service and apron landing. Photo taken soon after pier was completed.





San Francisco—Port of Gold

United Nations Conference Spotlights a Jewel's Setting

It was not an idle whim that prompted Louis Stellman to call his book about early San Francisco the "Port of Gold." The gleam of the days of '49 has been re-reflected from its eminences down through the years.

In the eyes of other nations, the United States stands for many things. One of them is wealth—the wealth that has enabled our country to produce the tools for victory. And from April 25, San Francisco, the financial center of the West, will be the United States to the whole world.

For the United Nations Conference on International Organization, San Francisco was a happy choice. World-famed, and most beautifully situated, its rugged past proclaims its future—and the task this Conference will set itself to perform.

Dean Acheson, Assistant Secretary of State, addressing the Commonwealth Club on March 20, predicted that: "the hopes of every man and woman, the future of every child, not only in this country of ours but in every country of the earth, hang upon what will be done in this great city in the next two months. For generations the name of San Francisco will mean a turning-point in history."

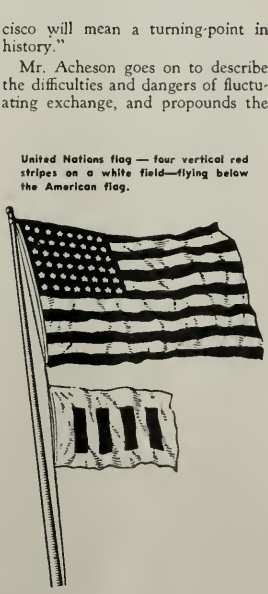
Mr. Acheson goes on to describe the difficulties and dangers of fluctuating exchange, and propounds the Bretton Woods solution. "First of all," he says, **"the members are asked to define their currencies in terms of gold."** Those 49ers would have loved that, and Shakespeare is confirmed in his

"The strongest castle, tower or town
The golden bullet beats it down."

The Bretton Woods agreements, however, are only obliquely related to the San Francisco Conference. It is the Dumbarton Oaks proposals that form the basis for the Conference plans. A design for world peace and order was laid out there, and when the United Nations meet in San Francisco they will proceed with the foundation and erect the structure, so that when peace comes the blocks of the nations will fit readily into place. As Henry F. Grady says: "the San Francisco Conference may well prove to be the most significant conclave in the history of the human race . . . It will be a great thing for future generations to hail San Francisco as the cradle of a new understanding and organization in international relations, the Queen City of World Peace."

The Port of Gold's Golden Gate is open yet.

United Nations flag — four vertical red stripes on a white field—flying below the American flag.



CARTELS

(Continued from page 217)

tain and to which they can adjust to their operating schedules.

Some cartels go a little farther and provide general sales agencies not only allocating orders as between firms, but actually as the selling agency for the members.

Another type attempts the distribution of the market on the basis of some geographical factor. There are also cartels which engage actively in certain phases of a business, especially finishing of semi-manufactures. These are organizations which take over production at a certain stage of the industry, allocating a portion of the raw material business among the various members.

And finally there is the bidding cartel, which exists to distribute the available amount of business among the member firms on the basis of some predetermined quota, by supervising their bids, especially on public contracts.

Bidding cartels, sales cartels—all the patterns of the cartel—very commonly employ the profit equalization device whereby firms making more than a certain level of profit would pay their so-called excess profits into the hands of the cartel organization.

The bidding cartel, the sales association, especially, have employed this device. These traits of cartels are, of course, by no means unlike many of the activities of certain types of trade associations which we cannot class as cartels. They have some of the attributes of the cartels, but not its essential elements.

Although these associations are somewhat like the cartel in form, they lack what I regard as the essential characteristics of the cartel, which is that each firm retains structural identity and financial autonomy but allows the major managerial decisions with respect to sales and price policy to be made by the central organization.

With these as the general types of the cartel, I suppose we should identify two other major classifications. In the first place, there are those cartels which are purely as private ventures, existing with the sanction of government but independent of that government insofar as policy determination is concerned.

The second type is the public sponsored, government controlled cartel which becomes oftentimes, to a large extent, an instrument of national policy. In Germany especially we have seen the development of this latter type.

I mentioned that the cartel had been an entity for approximately 70 years. There were in the early years of the modern period collective associations of producers and merchants, but they differed considerably from the modern cartel in form.

Actually speaking, the cartel probably makes its first appearance after the depression of 1872, when stringent efforts were made to protect the cost structures of the comparatively

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new German industrial firms which had been in the process of development for a relatively short time.

Among the principal devices which were brought into use was the cartel.

In Britain the development is much more recent than in Germany. As a matter of fact, the growth of the British cartel can be traced to the controls which were employed in connection with the last war.

Britain found herself in debt at the conclusion of the war, and for this and other reasons it was difficult for her to readjust her economy. Therefore, it is easy to see why she should have clung to the controls which were brought into use.

The development of the cartel in the inter-war period was very rapid indeed. It rose out of the effort to find some element of stability in the markets which were almost without exception rapidly falling apart.

The economic consequences of the peace bulk very large among the reasons for instability for European and foreign markets after the war. American tariff policy and our policies on international credits also were major factors.

The growth of bilateral clearance and trading agreements were among the efforts made to secure stability, but became part of the cause of instability.

As implements of such agreements, especially as instruments of bilateral trade agreements, the cartel proved to be a useful device. That was especially true of those cartels which had some relationship to the political or military policies of the various nations.

Suppose, for example, two nations viewing the instability of the world market and seeking to provide for their own needs came to some sort of a bilateral trade agreement. There arose immediately the necessity for an economic agency through which such trade could be controlled.

The cartel, subject to a central management, became a very useful device indeed for giving effect to such trade agreements, and as the decline of European trade progressed and as trading concessions became increasingly a part of the negotiations made to draw together political blocs of one sort or another, the cartel became increasingly useful.

Its rapid growth has brought us to the present situation and we find now among most of the European cartels two special general methods of procedure.

They try almost without exception to prevent over-production, to prevent a larger production than can be consumed by the existing market. They also strive to prevent the over-expansion of industrial capacity in order that their trading position may not be hampered.

They therefore duplicate on a collective basis all of the devices of monopoly. The cartel is, I think, essentially a type of collective monopoly which offers not only to the American business man the same obstacles to the expansion of trade, the same obstacles to competitive enterprise, as the monopoly practices of single firms which we have learned to expect here at home as well as abroad.

Now what can we expect in the post-war period?

To what extent will the cartel be utilized?

We know one thing:

Most of the economies of the European nations in the post-war period will be less able to sustain risks than they have ever been before, and devices looking toward the minimization of risks will therefore be much more attractive than ever before.

Britain before the war was in such a position that she was importing

the bulk of her raw materials and some 60 per cent of her foodstuffs. At the present time she has shifted her position from one of the most outstanding creditors to the heaviest debtors on international account.

Her external debt now amounts to some twelve billion pounds sterling—and is rising at a rate of approximately four billion per year. Before the war is over and readjustment accomplished she may well owe abroad a total of twenty billion pounds.

Consider the situation which she faces. She must earn enough to import the bulk of raw materials, pay for 60 per cent of her foodstuffs, and the service charges on a tremendous foreign debt.

Or, let us consider the somewhat similar situation of Russia, a state which has already turned to another type of collectivistic enterprise. This, so far as international trade is concerned, may be regarded as a government supervised or dominated cartel.

Our obligations to her are great. She bought for us, and for Britain, the time in which we armed ourselves. We certainly have a moral obligation, if no other, to help with her reconstruction.

Now, are we going to offer them the opportunity to relate their trade to the sort of relatively risk-free economy in which they can develop the resources which they will require?

If we choose to do so, the expectations which we now hold for the post-war will be realized. If not, we will be forcing Russia and Britain into the creation of bloc or bilateral trading agreements which might have the effect of isolating the United States.

In view of the risks which they encounter, the cartel and other forms of collectivism will be extremely attractive. And certainly unless some general trading agreement is prepared and put into effect, we may expect them to turn to all sorts of limited international agreements, bilateral agreements, and especially limited national blocs, for example, the Sterling bloc.

If they turn to those measures, we probably will have to go along with them. We may well have to attempt the same thing, unless we can offer them the opportunity to relate their trade to the sort of risk-free economy, or relatively risk-free economy, with which they must deal if they are going to survive at all.

Of course, there are those who will object that, regardless of what we do, European nations will have to trade with us anyway. "We have got the gold and we have got the goods, and they will have to come to us."

They don't have to do so at all. They tried coming to us in the Twenties. We loaned them money in large quantities on terms we specified, and on terms which they could not sustain. And our loans, in large part, were the agencies which pulled them farther down.

And then, when in debt, we slammed up the tariff barriers and refused to allow them those trading opportunities through which alone the loans could be paid.

There is little, if any, disposition among any of the European nations again to risk relationships with the United States if we behave again as we did before. They can rebuild again extensive trading blocs of their own. It's been done—very largely through the aid of cartels, and it can be done again.

Pacific WORLD TRADE

Consider, for example, the situation in Germany in the inter-war period. After the inflation the economy of Germany was probably as thoroughly disorganized as the economy of any great state has ever been.

France, on the other hand, was relatively strong, especially with respect to her gold position. She negotiated her collective security treaties, seeking to circumscribe Germany with an "iron ring" which would forever limit her powers of aggression. To these political and military treaties she added trade agreements. The terms which she specified were gold exchange terms.

Germany, impoverished, also went to the states of eastern Europe and said: "We'd like to trade with you. We have, or will have, goods for sale. We don't want payment in gold. We will take payment in raw materials. We will build up the special agencies which are necessary to promote such trade."

By trading cartels and by every possible device they built their trade. When Germany rearmed, they began offering in payment munitions and they traded large quantities of munitions for the large quantities of raw materials and food.

No gold was involved. No dependence upon the United States or London. The cartel, or any of the major devices and bilateral agreements, did the trick.

And, by the time they were ready for their next war, they invited military missions from the states of eastern Europe to visit Germany, pointing out to them that the munitions which Germany had been exporting were obsolete, in comparison with the arms she had built for herself.

Then they asked the question: "In the event of war, whose side would you like to be on? Will you fight with France against us, with arms that are not as good as ours, or will you string along with us? Remember, please, that in the years in which we have been trading, you have been bound to us economically, and if you try to break those bonds now the internal consequences in your countries will be more than your government can stand."

The French collective security scheme was broken, and German economic and military regemony was established.

They did it with cartels and they did it without gold, and the finance ministers and the business men of most of Europe have learned their lesson. If we force them into it they will do it again. The fact that we have the gold may mean little.

The thing which we must offer them is that progressive economy, steadily moving upward, which will offer to them and to us, insofar as it is possible to achieve it, the minimization of business risks.

There are two methods of achieving such a situation. We can have a purely competitive economy or planned economy. Both of them offer the prospect of steady expansion.

The answer is comparatively obvious—we want the competitive economy because it achieves the result with a minimum of central control and a maximum of other social values.

But it can only be achieved in a purely competitive economy. The objective of steady expansion will not be realized if monopoly elements enter.

At this point California comes in.

Why? When it comes to the development of a competitive economy in the United States offering the world the advantages of such a system, California may well be in a key position.

We are just now beginning the industrialization of this State. In 1940, 64 per cent of our people were engaged in services industries, only 12 per cent by manufacture, 11 per cent by agriculture.

We can build in California the sort of industrial economy which can recapture some of the benefits—all of the benefits—of competitive enterprise. We may produce a new birth of industrial freedom.

There are a great many obstacles to our doing so. For one thing, California industry, up to now, has experienced no coordinated industrial development. We have certain resources with which we can fight that—chief among them the work being done by the State Reconstruction and Re-employment Commission.

The rebirth of isolationism in the United States would be fatal to the prospects of California industry. If we keep our trade barriers down, we can build tremendously. If we let others put them back, we might just as well go back to selling oranges and climate and forget the industrialization of this State.

I don't believe that the obstacles to the development of a free competitive economy in California originate mainly from government. I believe that they are to be found principally in those monopoly patterns which appear at home and abroad, especially in the cartel.

I realize, of course, that monopoly patterns are almost inevitable in certain types of industry in which technical conditions make such organization more effective than any plan of competition. We must recognize the necessity of promoting the growth of many such enterprises, but I believe that their influence, their ability to create for themselves the situation of restricted competition, should be vigorously restricted.

As a matter of fact, the cartel will be very useful to many of the European states, just as the pattern of monopoly at home is certainly not without its economic justification, but they must be limited and their influence controlled.

I am opposed to any type of price fixing beyond that which is a necessary part of our wartime rationing and market controls. Administered prices, especially minimum prices, tend to make it possible for marginal capacity to be maintained after any economic justification for its existence has passed. The survival of such capacity may protect the investors and workers in such plants, but at the cost of losses to the community as a whole. Such a situation is socially undesirable. It represents an effort to escape the consequences of risk, and is a denial of the spirit as well as the fact of free enterprise.

The cartel, centralizing control of an industry or a market, readily lends itself to governmental purposes, and easily becomes an instrument of a national policy which may be undertaken for political or military reasons and with little economic justification.

The same applies to their use to create tariff barriers. They may function in lieu of tariff barriers in some circumstances, or the existence of the cartel may give rise to the demand for protection which results in a tariff barrier. In any case I find myself opposed to such a policy—and there find myself on common ground with the vast majority of all professional economists, almost all of whom, without exception, favor increasing freedom of trade.

I believe that the necessities of reconstruction will lead us to make use of every possible device which may offer a means to the end which we are trying to achieve. But in adopting such measures we should do so with the ultimate goal clearly defined, and constantly held before our eyes. A free society is not to be gained in a day—but it will never be gained if we are willing to stop short with half-way measures. The ability to see clearly, the willingness to sacrifice, the courage to risk change, are the indispensable elements in the character of a great man or a great state. I trust that the task we face will find us lacking nothing.

Exporting Heavy Machinery

(Continued from page 223)

attendant accessories and auxiliaries, such as vacuum pump, compressor, vacuum receivers, motors, drives, etc.

This equipment, comprising a normal net weight of 30,000 pounds, was destined for a mine located approximately three miles above sea level in the Peruvian Andes.

Specifications called for llama back transportation and a consequent limitation in the gross weight of any individual package to 100 pounds.

To meet these specifications it was necessary to sectionalize this large filter and its accessories to such an extent that it strongly resembled a jigsaw puzzle.



Such items as flywheels, gears, pump bases, shafting, etc., had to be cut up into individual pieces falling within the weight limits imposed, and tank and other steel parts had to be sectionalized to patchwork quilt proportions.

After sectionalization, the entire installation had to be assembled and all adjacent mating parts clearly and simply marked and instructions written to enable correct reassembly by peon labor after arrival at destination (no small problem in itself)—then disassembled and packed in individual boxes each falling within the weight limitations and each clearly marked for reference in reassembly.

The shipment as delivered when packed in this fashion consisted of some 400 individual boxes totaling a gross weight of 38,000 pounds, and it reached its destination without mishap—was completely reassembled without any difficulty on the part of the consignee and has been in successful and continuous operation ever since.

There are also many interesting engineering and packing problems involved, in other unique methods of shipment, such as by elephant back and dog sled, but the scope of this article will not permit discussion of them at this time, and they must be reserved for a future occasion.



Los Angeles Again Steps Out

(Continued from page 220)

East Coast and from England, Russia and Canada.

"(7) There is lack of adequate interior Latin American transportation for the shipment of raw materials.

"(8) There is a definite threat that Latin American countries will protect submarginal industries by the imposition of high tariffs and the payment of subsidies. This threat is part of common tendencies toward nationalistic policies.

"(9) American firms are reluctant to extend credit comparable to that granted by businessmen of other nations, and Americans fail to make proper credit investigations."

Mr. Rosecrans laid before the Chamber of Commerce World Trade Committee 10 recommendations for action:

"(1) Establishment of reciprocal relations with Latin American chambers of commerce must be followed up with careful, specific economic studies and continuous and expanding services.

"(2) Best results will be obtained in the reciprocal two-way trade-building program if correspondence with Latin Americans is carried on through the medium of their native languages.

"(3) Los Angeles executives should encourage visits here by Latin American businessmen.

"(4) A campaign should be launched to get Los Angeles County industries to allocate a share of their immediate post-war production to Latin American nations which are in distress from shortages.

"(5) A campaign should be started to reduce governmental interference with foreign trade and relaxation of export controls.

"(6) Tourist travel between Southern California and the Latin American countries should be actively promoted.

"(7) Every effort should be made to bring Latin American students here, and scholarships should be set up as inducements.

"(8) Vast improvement of shipping services is imperative.

"(9) American businessmen should establish sound, mutually satisfactory relationships with Latin Americans in order to capitalize on the Good Neighbor policy.

"(10) Los Angeles County businessmen should coordinate their foreign trade programs by utilizing the services of the chamber's world trade department.

Russia

(Continued from page 222)

would be multiplied In the case of Russia they would be trebled even without regard to the shipment of any capital goods.

But capital goods Russia must have, and she has already taken steps to obtain them. Various engineering groups have visited the United States recently and have placed substantial contracts with Pacific Coast manufacturers. The International General Electric Company has for some time been working on nine 90,000-kva generators for the Dnieprostroi hydroelectric plant to replace those partially destroyed by the retreating Russians, and finally destroyed after some repairs by the retreating Germans. The new generators will be the largest in diameter and in total weight ever built. Hydraulic turbines for the station are being manufactured by the Newport News Shipbuilding and Drydock Company. Each of these waterwheels will be capable of developing 100,000 hp.

When reconstructed, however, this one power plant can no more supply all of Russian industry than the Colorado River projects can supply North America. The latter will do well to take care of part of Southern California. Hundreds, if not thousands, of hydroelectric, steam-electric or diesel-electric plants, large and small, will be needed in Russia, and so will railroads and highways and mines and power lines and harbors and factories and farm equipment.

If the Government devotes its energies, as its friends say it will, to restoring the country and improving the lives of its people, there seems little likelihood that it will fail to find a way to finance imports that will, to quote Stalin again, "keep American factories running."

Whether any part of the projected purchases will go through Siberia or be hauled across the Pacific has not been indicated. As the post-war program unfolds, there will be some interesting developments for Pacific Coast manufacturers and shipping companies to watch.

	Exports from the United States to Russia	Imports from Russia into the United States
	(In Thousands of Dollars)	
1909-13 Annual Average	25,798	18,570
1921-25 Annual Average	33,336	4,309
1926-30 Annual Average	77,666	17,592
1931-35 Annual Average	33,022	13,040
1936	33,427	20,517
1937	42,892	30,768
1938	69,691	24,034
1939	56,638	25,023

Rubber

(Continued from page 219)

As to synthetic rubber:

To parallel reductions in the price of natural rubber, it would be in the public interest to reduce the production of synthetic rubber in the higher cost plants and continue production in the more efficient plants as the overall need for synthetic rubber declines.

The advantage to the American people of a sound basis for dealing with natural and synthetic rubber production and prices may be appreciated from this fact:

The difference between 10c a pound and 20c a pound for the basic raw material—based on the anticipated American consumption of 850,000 tons a year when peace is restored—would be $190,000,000.

These savings in four years would be equivalent to America's expendi-

ture for the war-necessitated government synthetic rubber plants.

Such savings, moreover, would continue for many years if sound policy is adopted for maintaining natural rubber and synthetic rubber in an equilibrium based on efficient production and low prices.

As to the procurement of available natural rubber:

For the duration, centralized purchase of natural rubber and allocation by each nation to its rubber products makers need not be changed.

This procedure will help the orderly return of natural rubber to greater use.

That the rubber people of the Netherlands Indies expect to lose no time in getting their rubber back into circulation is indicated by Dr. Pieter Honig, director of the Netherlands Indies Rubber Research Institute, who reports that natural rubber will be exported within three months after liberation of the areas. He said that private enterprise, free of any governmental control, would be reestablished as quickly as possible and that $15,000,000 worth of rubber-producing equipment, representing about 25 per cent of what is normally required, has been purchased in the United States to replace the destroyed facilities.

Some of the Indies rubber will go right back to them in the form of manufactured products, for the new Goodrich Pacific Coast office is planning to ship tires and tubes for automobiles, agricultural and highway equipment, conveyor and transmission belts, hose of all types and a wide range of other products for industrial use, along with its line of aeronautical materials and chemicals.

Goodrich is not the first company to set up elaborate export facilities on the Pacific Coast, nor will it be the last.

Pacific WORLD TRADE



Refrigeration on San Francisco waterfront.

Harbor Facilities

(Continued from page 226)

trunk lines performs the service of switching cars to and from the piers.

There is also a great variety of cargo-handling equipment required—jitneys, pallet boards, cranes, high piling machines, trucks and heavy lift floating derricks. And it goes without saying that electric current for light and power purposes and water for various uses must be provided. Other necessary items are fire and police protection, rodent control, safety measures for the protection of employees, and pilots and towboats to guide the ships in and out of the harbor.

No doubt one of the greatest items of expense is stevedoring (handling cargoes in and out of the ships). In some instances this service is provided by the Harbor Boards; in others, by private operators, as are also carloading and unloading and the reconditioning of damaged packages.

Harbor management is a highly technical business and requires a trained staff of employees with long years of experience if the port is to be administered in an efficient manner—and a large port requires a large staff—engineers, surveyors, accountants, clerks, stenographers, traffic managers, wharfingers, inspectors, various types of superintendents and men of dozens of crafts and trades. The Harbor Boards not only design and construct the facilities but also maintain them and the maintenance of the massive structures that are exposed to the elements. The salt water, the pounding of the tides, the marine borers, and the weight of the ships and cargoes make this no small task. Dredging is a most important function, for the water in the slips between the piers must be kept at a sufficient depth to float the largest ships that enter the harbor.

The staff must be familiar with the best berths for each particular operation and also with customs, quarantine, immigration and other governmental regulations, and the availability of tugs, barges, and other floating equipment.

When ships arrive and sail on time, when trains are on schedule, when a play runs smoothly, it isn't just luck—it is the result of careful planning and perfect coordination of effort by men who know their business. The fact that the general public gives no thought as to why its overseas shipments arrive and depart as expected is a great tribute to the smooth functioning of the harbor organizations.

Foreign trade is developed by others and the merchandise is transported from one place to another by the steamship companies, the railroads and the trucks, but it is well for the public to know and appreciate the part the public ports play in the movement of waterborne commerce, for the Harbor authority, by whatever name it may be called, is just a group of expert shipping men working day and night to facilitate traffic by every modern means. Their place in world trade is no less important than that of the carrier. They are all serving the shipping public.

Double-Dip Hot-Galvanizing

Hubbard & Company's branch factory at Emeryville, California, is well known on the Pacific Coast for its war record in the production of a wide assortment of heavy construction and marine hardware. However, in the course of fulfilling these very important war contracts it was found necessary to add to these facilities one of the most up-to-date galvanizing plants on the Pacific Coast, fully equipped to handle any type of hot-dip galvanizing.

The main building housing this equipment is 320 feet long by 70 feet in width, located on a spur track of the Southern Pacific Railroad. There is a private road leading to the northern entrance for unloading trucks, and an inside loading platform at the south end for shipping-finished material. Overhead there are two five-ton bridge cranes which facilitate the speedy handling of heavy materials.

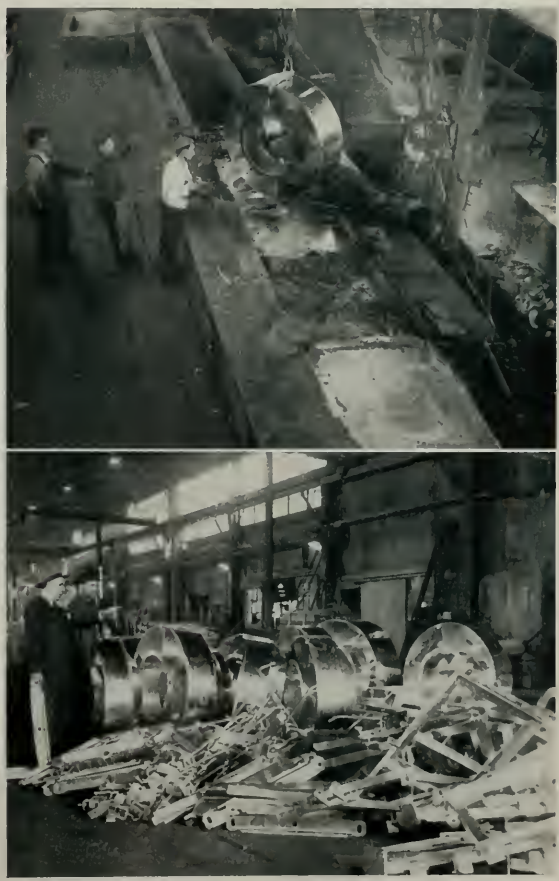
The galvanizing equipment consists of two 25-foot steel kettles containing the molten zinc. There are also six 30-foot tanks containing muriatic, sulphuric and hydrofluoric acid, water, and caustic soda, all of which are necessary for the proper processing of material before the hot-dip galvanizing operation begins.

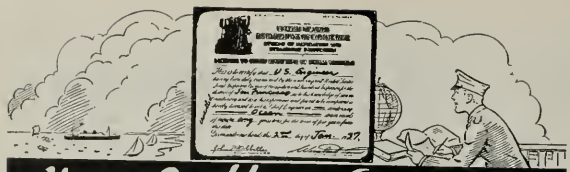
Belt conveyors and air hoists are also used extensively in conjunction with many different labor-saving devices which assure prompt service and high quality workmanship.

Double-hot-dip galvanizing is a science. A study of the coating put on by the hot-dip process shows that it consists of two parts, an outside coating of pure zinc and an inside layer of zinc-iron alloy. The thickness of this zinc iron alloy and the density of the zinc coating determines the rust-resisting qualities or the life of the coating. The bond between the zinc and iron is governed by the zinc iron alloy—the thicker the alloy the more firmly the zinc adheres to the iron. The longer the articles remain in contact with the molten zinc the thicker the alloy formed. Therefore the value of double-dip as practiced by Hubbard is apparent. As long as the only claim for single-dip galvanizing is lower cost, the company will continue its rigid use of the double-dip non-porous process.

In February of this year the company was awarded the fourth star to its Army and Navy "E" for its continued outstanding war production record.

The top photo shows a view of steel kettles containing the molten zinc. Below are shown some of the finished galvanized marine products.





Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Electrical Brushes and Commutation*

There are many items of equipment and devices aboard ship to engage the attention of the engineer officers. General knowledge and standard practice covering commutators and brushes of direct current generators and motors has been greatly increased in the past years. Yet there are times when brush sparking and commutation trouble may be very annoying to the electricians.

In order to cover the new and important knowledge on this subject, several issues in this section will be devoted to these problems.

The design of direct current machines for optimum conditions of good commutation is well known today. The chemistry and mechanics of good commutating brushes are well understood and the effect of the many factors and materials in brushes is well evaluated. Nevertheless commutation is a problem for the electrician which must never be overlooked.

The disturbing factors which upset a condition which is otherwise satisfactory are so many and varied that they must be studied individually.

Aside from a few exceptions nearly all disturbing conditions in, around and about a direct current machine manifest themselves sooner or later in sparking at the brushes. This sparking may result, but not necessarily so, in roughening, scoring or grooving of the commutator, which of course makes the sparking even more noticeable.

This leads to the question of the relative degree of sparking and a standard reference so that it is possible to report on and discuss sparking intelligently.

Figure 1 shows six degrees of commutation ranging from so-called good or black commutation to destructive sparking. Condition No. 1 or No. 2 may be perfectly normal. Condition No. 6 is dangerous to operate as it may lead to a **flash-over.** This means that the tail of the spark or arc drags along with the commutator until it reaches the next following brush, which then constitutes an arc between brush studs, which is a very severe short circuit. If on a motor, the breakers will be tripped open; but if on the generator, there is no breaker or fuse in the circuit to open and the arc may burn great holes in the brush holders and studs. It may eventually be blown out by the windage and magnetic forces of the generator, but is destructive while it lasts. The commutator is usually badly pitted following a flash-over.

The brushes and commutators have several important functions. They must carry the load current to and from the high velocity surface; they must carry some current between bars of the commutator which are short circuited; they must slide on the commutator or ring surface with minimum friction and without lubrication at speeds as high as 70 miles per hour. Five thousand feet per second is considered a normally high velocity for the commutator surface.

It is difficult to obtain a brush material to combine all the necessary properties without some property which may be injurious. The optimum combination is therefore a compromise. Furthermore one combination of brush materials may be eminently satisfactory under one set of conditions and entirely unsatisfactory in another set of conditions.

The essential elements of good performance of brushes and a commutator may be considered as follows:

(1) No injurious sparking, such as No. 1 or No. 2, Fig. 1..

(2) Practically no commutator wear. Note that this contrasts with standards of years ago when wear was expected and copper dust around the machine was considered good practice.

(3) Uniform glossy appearance over the surface of the commutator.

(4) Minimum electrical and mechanical losses.

(5) Minimum noise in operation.

(6) Satisfactory brush life of several months at 24-hour-daily service.

Commutator wear may result from excessive abrasive or polishing action material in the brushes, or from sparking or burning of the copper due to some faulty condition. Excessive film formation with resultant film breakdown may cause copper to be embedded in the brushes, which then grooves the commutator. Also reduction of commutator due to resurfacing or turning should be classed as wear. With satisfactory brush operation commutator wear should not be an important item of machine maintenance. It should be negligible.

The nature of the surface of the commutator has a profound influence on brush operation. A smooth and uniform surface must be maintained. Sudden or slow change in the appearance of this surface is almost certain to result in a change in brush performance.

Quietness of operation is dependent on an uninterrupted or intimate contact between brushes and the commutator. Even where noise is not obnoxious, brush noise is indicative of some condition which may eventually grow into serious injury.

Brush life must not be made the primary objective of satisfactory performance. In fact it may be desirable

*(The National Carbon Company, Inc., a unit of the Union Carbide and Carbon Corp., publish a series of bulletins under the title of "Modern Pyramids," which is used as a guide in preparing these articles.)

so to select brush materials that life is sacrificed for reduction of commutator wear.

Brush Contact

The nature of the contact between the brush and the commutator is complicated and easily disturbed. Due to the slightest play of the brush in the holder, the yielding of the supports under changing stress, to vibrations, the curvature of the brush contact surface will be a longer radius than that of the commutator. Thus the actual area of solid contact at any particular instant is likely to be small. In fact, contact between any two surfaces is hardly more than two or three points unless pressure is applied to the point where the materials involved yield to allow the surfaces to conform. These point contacts therefore are carrying current at extremely high density; are all shifting from area to area of the brush contact surface. They are individually in contact for a very short time.

It may be considered that the contacts carrying current are of different kinds, as follows:

(1) Points of solid contact, carbon brush to copper commutator.

(2) Points or area where the conduction is through particles of carbon or copper dust.

(3) Areas where the current is jumping an extremely short gap in the form of a minute arc.

The fact that the brush face shows a smooth, evenly-polished surface does not mean a uniform contact at all time, but rather points of contact rapidly shifting from area to area. Nor does this shifting contact consideration interfere with the generally accepted fact that as an average the bars under the brush may be considered as short-circuited.

Because of the firm contact necessary in modern practice, the protruding mica of the commutator cannot be tolerated. With few exceptions all mica is undercut. There was a time when undercutting was so deep, or so narrow, as to allow impacting dirt and carbon dust to collect in the slots, finally shorting bar to bar and pitting the copper. (Undercutting practice will be discussed in a succeeding article.) A reddish ring of fire partially or all around the commutators is usually red hot carbon dirt glowing due to current conduction until it burns up. With little or no commutator wear, shallow undercutting can be used and the slots so cut will not collect dirt but will be self-cleaning. Oil, of course, encourages collection of dirt in the slots, and this is one of the many reasons for keeping the commutator absolutely clean of oil.

Surface Film

Probably the most important single condition affecting good brush performance is the nature of the surface film on the commutator. The nature of this film, shown in cross section in Fig. 2, varies greatly with operating and atmospheric conditions, and the thickness and characteristics of this film greatly influence brush performance.

Graphite is frequently found in this film and may be the principal reason for an exceptionally dark brown or black color of the commutator. It may be deposited by a rubbing action or transferred from brush to copper by the electrolytic process, similar to electrolytic plating of metals on surfaces.

No matter what care is used in preparing and finishing the copper surface, the microscope will disclose fine irregularities, as indicated in Fig. 2.

A fresh raw copper surface does not give best brush performance. Some film is advantageous, reducing friction and improving commutation due to the slight electrical resistance of the film. Too much film, however, will cause other kinds of trouble with pitting and grooving. The development of a satisfactory film on the commutator may take several days or weeks, depending upon surrounding conditions.

Some types of the electro-graphitic brush may require considerable load or current to develop the film, and at low current densities or running at no load may not develop film. In fact, running at light or no loads may wear off the film already developed. When this happens, copper or copper oxide particles may deposit in the faces of the positive brushes for generators (negative brushes for motors). These foreign particles imbedded in the face of the brush may gall or groove the commutator, causing narrow, deep rings in the surface. This process is called **threading** because of the fine thread-like grooves. This type of film breakdown may account for many cases of operating difficulties found on long-continued no load or light load.

The development of the oxide film can be accelerated by the application of heat to the commutator.

The property of forming a graphitic film varies with different grades of brush materials. Some graphitic deposit is desirable as it reduces friction, increases the area of contact and helps to maintain the inter-face electrical resistance necessary to control the short-circuit current which flows when two or more bars are shorted by the brushes.

Some brush materials may have a polishing or film-removing effect. This is sometimes desirable where the film is built up due to oil in the atmosphere, or chlorine or sulphur poisons are present in even the slightest traces. Also this polishing action is desirable if there is a tendency toward edge burning of the bars. The polishing action must of course not be great enough to cause commutator

(Page 248, please)

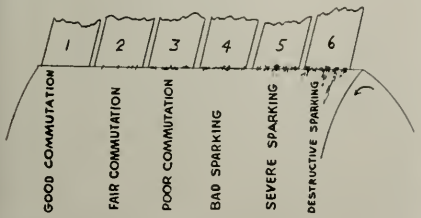


Fig. 1, left: Standard for gaging degree of sparking.

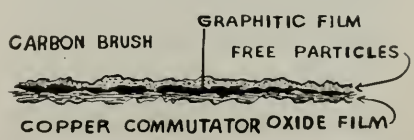


Fig. 2, below: Greatly magnified cross section of the commutator film.



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The Gyro-Compass

Part V. Auxiliaries and Accessories

Auxiliaries of the gyro-compass include the repeaters, of which there may be several in various parts of the ship; the course recorder; the radio direction finder repeater; and the auto-pilot, or "Iron Mike."

Repeater Compasses

Of repeaters in general a brief discussion may be in order. In the design of the several types of repeaters the aim has been to improve the facility and accuracy of navigation, and for this reason ships' officers should be familiar with the type and use of each. The steering repeater is mounted beside the ship's wheel and is provided with a reading glass which magnifies that part of the card in the vicinity of the heading of the ship. Steering repeaters are supplied for column, tripod or bulkhead mounting, or, where the gyro-pilot is used, the steering repeater is mounted on the gyro-pilot binnacle beside the ship's wheel. Steering repeaters can be tilted or turned in any position convenient to the quartermaster or watch officer.

Bearing repeaters are mounted on the bridge wings on column or tripod stands equipped with gimbals so that the repeater can be leveled for taking azimuths of the sun with an azimuth circle. Such repeaters are installed with the lubber's line parallel with the fore-and-aft line of the ship.

The radio direction finder repeater provides a means whereby direction finder bearings can be read directly on a "live" compass card which is energized by the master gyro-compass. This repeater may be mounted as a complete unit under the rotatable index of the direction finder, or in other cases a repeater motor is supplied to the direction finder manufacturers, who build it into the set. In some cases where it is not practical to incorporate a repeater in the direction finder, a repeater compass from which the ship's heading can be read is mounted alongside the direction finder apparatus.

Just as the use of the bearing repeater increases the celerity and accuracy with which bearings and sights may be obtained, so too does the use of a radio direction finder repeater improve the effectiveness of the radio direction finder. When using a bearing repeater, only the sense of vision is required; but when using a radio direction finder, the operator depends upon his sense of hearing as well as his sense of vision. If only a dummy card is used, he must first set the card to the ship's course and then correlate the sound input of the receivers with the ship's heading, as verbally transmitted to him by the quartermaster, and then note the reading on the card. Before this can be done the ship may have yawed several degrees off her course, appreciably affecting the results. With a gyro-compass repeater under the direction finder index, the card is always kept accurately set to true north, thereby enabling the operator to make his reading at his own convenience without the necessity of cooperating with a second party.

The Course Recorder

The importance of the course recorder can hardly be overestimated. In everyday use it provides a visual check upon the quality of the steering, gives a permanent record of every angular movement of the ship's head at the time such movement takes place. Properly annotated, the course recorder supplements the ship's log, and the owners, who cannot afford to gamble with fog, reefs and shoals, are afforded a further safeguard as their valuable property moves from one port to another in pursuit of cargoes. Many times the course recorder has been the deciding factor in collision cases and has saved the owners thousands of dollars on costly litigation. They are admitted in evidence in admiralty courts.

When automatic steering through the gyro-pilot is employed, the course recorder shows graphically when the best steering is obtained and by this means the "weather" and "rudder" adjustments on the gyro-pilot can be set to secure the most accurate results for any set of conditions.

The course recorder, illustrated in Fig. 21, is a complete unit operating on the repeater circuit from the master compass. It comprises a repeater motor which drives the controlling mechanism for an indicator dial and a pair of ink pens. A clock-controlled drive roller feeds a paper chart under the pens at a proper rate, and a spring-driven rewind roller winds up the paper and keeps it taut. The action of the rewind roller is similar to that of an ordinary window shade, except that an automatic lock is provided on the spring drive to guard against excessive speed.

The mechanism of the course recorder is shown in Fig. 22. The repeater motor shaft extends in both directions, each shaft end carrying a worm. The upper worm drives the indicator dial, while the lower worm



Fig. 21: The course recorder.

drives a cam cylinder. This cylinder has a groove which causes a trolley, carrying the course pen, to travel horizontally so that the course pen matches, on the chart, the position of the indicator dial. The dial periphery constitutes a cam which causes the zone pen to shift from one zone to another on the chart, according to the dial position.

The clock mechanism is enclosed in a metal casing from which the necessary winding stems and control knobs protrude, at the left.

The recorder chart is a specially printed sheet of paper 90 feet long, sufficient for a continuous record of 30 days.

A window is provided in the front cover to enable an observer to examine several hours of record without opening the instrument. An auxiliary indication of the ship's heading is also provided, when the cover is closed, by an azimuth scale concentric to the motor-driven indicator dial within.

A lamp, controlled by a switch on the upper right corner of the cover, provides illumination for reading the chart at night.

The operation of the course recorder requires no special training, all of the directions necessary being contained on an engraved instruction plate on the front of the instrument. The point which should be impressed upon the user is the importance of keeping the record properly. In order to augment the value of the record, notations should be entered liberally on the chart in regards to alterations of course, weather conditions, wind—anything, in fact, which tends to affect the steering of the ship. If steering by gyro-pilot, the weather and rudder adjustments should be noted on the chart, as well as the nature of the sea, whether moderate, rough, a beam sea or a head sea. The clock on the recorder should be checked every watch and the error, if any, noted on the chart

Course changes of themselves have little significance unless the exact time at which they took place is known. The more important the event, the more necessary it is to pin it down to a definite time. The course recorder clock cannot be expected to operate as accurately as a chronometer, and for this reason care is required on the part of the ship's officers to see that it is set correctly and that any discrepancy is noted.



Fig. 22: Mechanism of the course recorder.

The time factor in connection with the course record can be of the utmost importance if it should ever be

(Page 248, please)

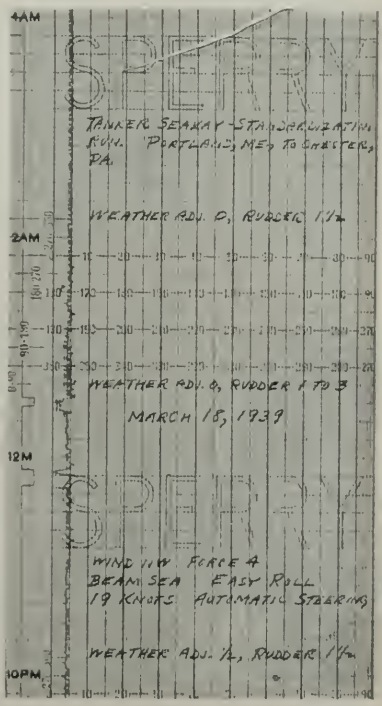


Fig. 23: Sample course recorder record, showing effect of adjustments. Read from bottom up.

(All diagrams courtesy of Sperry Gyroscope Co., Brooklyn, N. Y.)



Curtola shipyard before outbreak of war.

An Oakland Ship Repair Plant

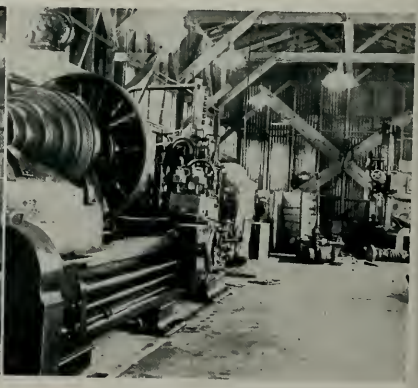
Shortly before the outbreak of war Lawrence Curtola, president of the Curtola Company, purchased the Bagley and Nunes shipyard at the foot of 19th Avenue in Oakland, and immediately proceeded to modernize the plant and build tugs and barges for the U. S. Government.

This plant had been operated as a shipyard for 35 years by Bagley and Nunes, builders of small wooden ships, so extensive alterations and additions were necessary in order to expedite the output of vessels under Government contracts. It was found

A corner of the Machine Shop.



Another corner of the Machine Shop.



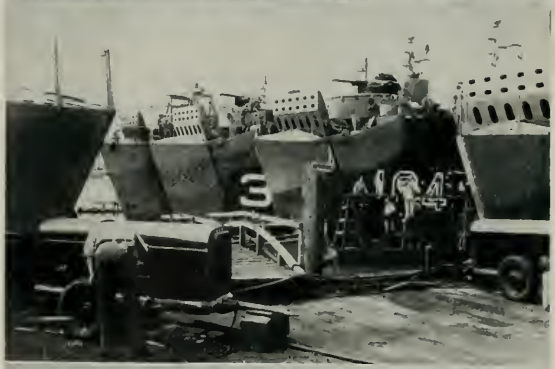
necessary to pull down most of the old structures and replace these with larger and well-equipped shop buildings. In the case of the sheet metal shop it was found advisable to purchase the complete up-to-date sheet metal shop of a well-known Berkeley company and move the equipment to specially prepared quarters in the shipyard. The Curtola Company is now called on to handle outside sheet metal contracts for other local yards. The marine railway capacity has been



Curtola Company's repair wharf today.

increased to three, and total number of employees has increased from seven to four hundred.

Since the completion of the Government shipbuilding contracts the company's facilities have been entirely devoted to ship repair work. The type of vessels repaired in the yard vary all the way from small fishing boats up to and including Liberty ships of the commercial type; and from small naval landing craft up to and including destroyer escort



A few landing craft at the company's repair wharf today.

vessels of the combat type. Perhaps the ability to handle such a variety of work is due to the fact that all of the company's department heads are old-time shipbuilders and repair men.

The company is under the able management of Lawrence Curtola, and Howard E. Hoffine is the assistant general manager. Other members of the staff are Harry E. Wilkinson, yard superintendent; George Hodgins, officer manager; and E. P. Galeano, head of the purchasing department.

An interesting personality still on the company's pay roll is Percy Bagley, who was one of the founders of the original Bagley and Nunes Company 35 years ago.



Another view of the present repair wharf.



Condition of ship plate as it appears before it has been flame-cleaned. The lighter-hued flakes show the abundance of mill scale.

Flame-Cleaning of Steel Surfaces

Flame-cleaning, or "flame-priming," as it is more appropriately called, was introduced about six years ago as a method of preparing surfaces of structural steel for their initial coat of paint. This is accomplished by intimately scrubbing the entire surface of the metal with high-velocity, high-temperature oxy-acetylene flames. It has the virtue of removing all unbonded scale, foreign material and contaminants, leaving a warm, dry surface upon which to apply paint, thus producing a paint coat which has superior corrosion resistance and an extremely tight bond.

The older and better-known processes of cleaning steel, prior to the application of paint or other protective coatings, are sandblasting, chemical cleaning, or mechanical cleaning. Each of these processes has certain characteristics, some advantageous, some otherwise. Sandblasting can be made to effect complete removal of scale and rust, and is especially good where the surfaces are easily accessible. However, in certain structural steelwok, as is common in shipbuilding, small particles of sand and grit are driven into crevices of the assembled pieces, and it is almost impossible to remove all of this "foreign material" prior to painting. The dust arising from this process is very annoying to everyone in the vicinity and sometimes interferes seriously with production schedules.

Chemical cleaning methods, such as are widely used in the automotive industries on light steel, require the use of water or water solutions, and the drying of this water from the steel is a serious problem. Complete pickling of all shapes and plates used in ship construction requires the installation of extensive equipment, and the time and labor involved in this process makes it somewhat expensive and slows up production considerably.

Mechanical cleaning, the process ordinarily used for structural steel work, implies such operations as wire brushing and scraping, power brushing, or the various methods designed to break away scale, rust and dirt by hammering. None of these procedures get under the scale, or its edges, to lift it from the steel. They tend, rather, to push the scale against the steel, as the points of the tools blunt easily and thereafter just ride over the edges of the scale, or other foreign matter, on the surface of the steel. The power tools used for mechanical cleaning are bulky, and it is difficult to clean complicated structural work with them. Cleaning with hand tools is a slow process and often lacks the power necessary to clean effectively.

Flame-cleaning of structural steel requires intense, high-temperature flames to be traversed over the surfaces to be cleaned so that they heat the surface scale quickly and cause it to expand and free itself from the underlying steel before the steel is warmed enough to expand appreciably. This operation is immediately followed up by a thorough wire brushing, which breaks away any partially free scale, dirt, or rust, and removes the freed material from the surface. The heat of the flames also warms the steel and drives moisture from its surfaces and from the crevices between the assembled parts. Paint applied before the steel has cooled to the temperature of the surrounding atmosphere flows easily and forms a thoroughly adherent, uniformly protective coating on the steel. An accompanying advantage is that the paint sets up more quickly and from the metal out, thereby eliminating the tendency of a skin to form and blister.

Some of the tightly adherent oxide scale will withstand the action of the flames, but any scale which resists the rigorous expanding action of the intense heat of the flames is so tightly adherent that it not only serves to protect the steel from corrosion, but also provides an ideal base for the priming coats.

The heart of the oxy-acetylene equipment, required to produce the rigorous heating action, is the heating head, an action close-up of which is shown in the illustration. The 49 flame ports in this head are spaced 1/8" apart, giving a 6" flame coverage. These ports are 20 thousandths of an inch in diameter, but despite their size they throw flames over 1/4" long, indicating the high velocity of the burning gases. When operating on flat surfaces, two heat- and wear-

resistant alloy end skids keep the head the proper distance from its work. Also made of this special alloy are wear pads which run the entire length on each side of the nose of the head. These pads protect the flame ports in such a way that no matter at what angle, or over what surface the head may be forced, there can be no damage to the head.

Depending on the type of work being performed, the head is attached either directly to the blowpipe, or to the blowpipe by means of an extension arm, the blowpipe in turn being connected by lengths of hose to suitable supplies of oxygen and acetylene. The equipment is highly adaptable and easily handled.

In discussing flame-cleaning procedures it might be well to follow the specifications as recommended by the American Institute of Steel Construction. Summarizing, the cleaning and painting procedure requires four major operations. These are: (1) oil and grease removal; (2) flame-cleaning; (3) wire brushing; (4) painting.

A helper with a bucket of mineral spirit solvent and a hand mop usually performs the cleaning operation well in advance of the flame-cleaning operator. Care must be exercised in the mopping up operation so that no tar or gummy-like substance is left in low spots.

Oxy-acetylene flames—after extensive tests—have been accepted as best, because of the high flame intensity obtained and the dehydration factor present during this process. The specification for an oxy-acetylene ratio of at least one eliminates smoky flames, thereby enabling the operator by visual examination to set the neutral flame. The ratio of the flame length to the port diameter sets up an index of the flame velocity: the longer the flame burning from a port the greater its average port velocity. While eight is considered a minimum value, ratios at least 50 per cent higher are often used; the nature of the work and the experience combined are the determining factors. A six-inch head of the type mentioned previously can be manipulated into almost any complicated piece of structural work, the blowpipe usually being held so that the flames impinge at an agle of 60° plus or minus 15°. Operating with the flames normal to the plate is somewhat more efficient, but it is more difficult to watch the action of the flames. The blowpipe operates equally well on a vertical or horizontal surface, and may be pushed or pulled. The speed of the blowpipe travel is learned by a little experience; too slow a speed tends to fuse the scale rather than flake it off.

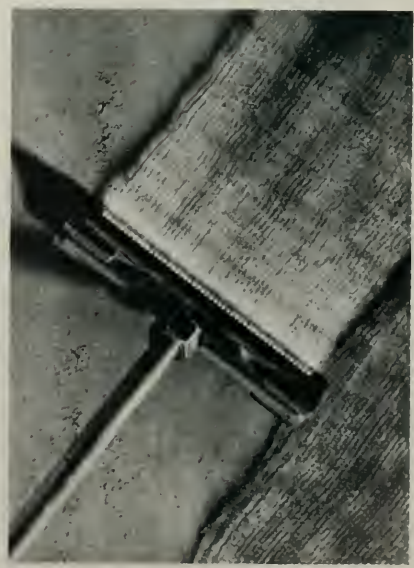
The exertion of a light pressure by hand, with a wire brush, after flame cleaning is usually sufficient to reach the clean surface. Compressed air must never be used to blow away loose scale, because of the presence of oil and moisture in such air.

The problem of painting flame-cleaned surfaces is outside the scope of this article, except insofar as the specifications require that the surface be painted before it reaches the temperature of the surrounding air; the time interval, generally speaking, should not exceed two hours. At the end of the day, or at other shutdowns, all flame-cleaned surfaces should be painted and never left until the next day, otherwise additional flame application is necessary.

While speeds as high as 50 feet per minute on new materials have been obtained, a good average figure is 20 to 40 feet per minute. A value of 1000 square feet per blowpipe hour (using a 6" head) is a fair representative maximum value from which to start to make deductions for contingencies. At this speed 13 cu. ft. of oxygen and the same value of acetylene are required for 100 sq. ft. of surface. For standard sections consumption will run between 30 and 50 cu. ft. per ton: light channels and angles 100 cu. ft. per ton. All the above is based on working on flat, smooth surfaces, this speed being reduced about 50 per cent on riveted areas with a corresponding increase in the gas consumption. Skilled labor is not required to perform the flame-cleaning operation, and the technique can be acquired in a very short time.

Comparative tests show that flame-cleaning requires less than half the time of sandblasting and costs half as much.

On ships building under the supervision of the U. S. Maritime Commission at Marinship Co., three Kaiser Co. yards, and Bethlehem Steel Co. Alameda yard, flame-cleaning is now standard practice, 90 per cent of this being done after the work has been fabricated and assembled. It is the consensus of the best informed in these yards that the adoption of this process in preference to the pickling process has been a factor of considerable importance in expediting the delivery of ships.



View showing flame-cleaning head in action. The dark streaks that appear on the plate surface are black magnetite, and the silvery streaks between them are sponge iron, both of which can be easily swept off the surface. Any particles that remain will be absorbed in the paint with no harmful effects.

Marine Hardware Maker Expands



G. Chauncey Parsons
General Manager.

The Durkee* Marine Products Corp. of New York announces an expansion in the company's operations by the opening of a new office in Seattle, Washington, as of February 12, 1945.

A year ago last January this firm opened their West Coast Division with an office at San Pedro, California, in order to provide better service for their many West Coast customers.

G. Chauncey Parsons, chief engineer of the company, was transferred and put in charge of the whole West Coast territory, including Alaska, Hawaii and all export business from the West Coast. Mr. Parsons is a mechanical engineer (member of the A.S.M.E.) with many years' experience in the marine field. He is also a well-known yachtsman in the New York and Maine areas.

Due to the rapid expansion of the company's business at San Pedro, and the insistent demand of the West Coast yards, particularly in the Seattle and Portland areas, the Seattle office was opened.

C. R. Mosher
Seattle Branch Manager.



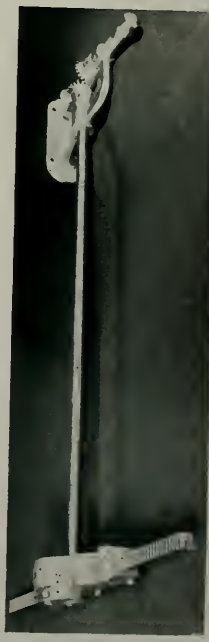
Charles R. Mosher will be in charge of this new office as service engineer. Mr. Mosher has had a great deal of experience in the marine field and will cover the Northwest territory from Portland, Ore., north to the Canadian line.

The Durkee* Marine Products Corp., one of the oldest American manufacturers of marine hardware and marine equipment, have their main office and plant at Grasmere, Staten Island, New York City, and are well known both nationally and internationally for their many fine quality products.

Since Pearl Harbor they have been supplying such items as engine room telegraphs and accessories, navigation lights, voice tubing and accessories, steering gears, port lights, air ports and other items to the Maritime Commission, the U. S. Navy, the U. S. Coast Guard, the U. S. Army, and a great many of the leading ship and boat builders of the country.

The West Coast Division has developed many new items, such as special manholes, watertight doors, hatches, port lights, and steerers, to meet the particular needs of the West Coast ship and boat builders.

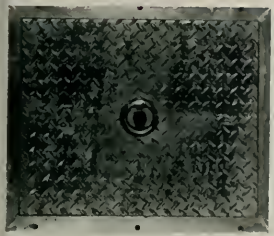
Many of the smaller boats, such as the 45' Picket Boats, built both on the West and East Coasts, have been



Shaft and gear transmission for steering.



Steering wheel.



Hatch.



Left: Engine room telegraph.

Below: Port light.



equipped with the well-known Durkee* Marine steerers.

The Navy refrigerated cargo vessels now being built are all equipped with manholes, hatches and escape hatches of Durkee* Marine design . . . and, of course, have U. S. Navy approval.

These hatches were originally developed for commercial fishing vessels and have been adopted as standard equipment by many yards, due to their many advantages.

Duplex steerers are another item especially developed for the boats of the fishing fleet. These steerers provide positive steering from topsides and pilot house.

With the main office and factory in New York City, West Coast headquarters located at San Pedro, California, where more and more manufacturing is being done, and the new office in Seattle, this well-known company can render prompt and really efficient service to the many ship and boat builders and repair yards of the country.

Book Reviews

Materials and Processes, by James F. Young (John Wiley & Sons, Inc. $5.00). The book deals with the selection and use of materials in design engineering, including an analysis of forging casting and heat-treating. It presents a broad study of materials and manufacturing processes and is intended for convenient reference and textbook use, and to provide the practicing engineer or designer with an overall picture of the subject discussed.

Control of Electric Motors, by P. B. Harwood (John Wiley & Sons, Inc. $5.00). The author, who is manager of Engineering, Cutler-Hammer, Inc., Milwaukee, and Fellow, American Institute of Electrical Engineers, has presented in this second edition, new tables giving ratings of motors and controllers, complete information about synchronous motor control and variable voltage control. The book briefly describes the characteristics of various types of motors and explains how these motors are used for control purposes. Knowledge of motor control is essential to everyone working with electric motors. Problems frequently encountered are discussed in detail.

Handbook for Shipwrights, by H. F. Garyantes (McGraw-Hill Book Company, Inc. $5.00). This book is designed to solve everyday problems encountered in the construction of a ship. Hull construction is thoroughly treated. The book is carefully delineated with sectional drawings, tables and photographs. It contains an excellent mathematical section and should be very valuable to any shipwright.

Sea Language Comes Ashore, by Joanna Carver Colcord (Cornell Maritime Press. $2.25). This is an amusingly illustrated, alphabetically arranged book of 223 pages, containing nautical words and phrases with their definitions and derivations. It is interesting to note how these pungent expressions have crept into our general vocabulary and added wit and vitality to our language.

On the Ways—

SHIPS IN THE MAKING



At left: One of the largest ships ever to pass through the city's bridges across the Willamette, CVE 116 is pictured maving majestically through the raised Burnside bridge. Portland witnessed, on February 20, the arrival of the second CVE 105 class hull from Puget Sound to be completely outfitted at Commercial Iron Works.

Below: An unusual photograph taken at U. S. Steel's Federal New Jersey shipyard. The "shadow ship" is not aground on a rock-strewn shore on a moonlight night. Rather, the scene was taken on a murky morning "into the sun," just after the ship's launching. It is the cradle sections you see floating around after being washed free from the ship's sides.

Todd Pacific to Build Four More Carriers

Todd Pacific Shipyards, Inc., will build at its Tacoma shipyard four additional CVE escort aircraft carriers for the United States Navy to cost approximately $44,000,000. They will have a standard displacement of 12,000 tons, a length of 550 feet and beam of 75 feet. With the addition of these four carriers to the present schedule, the Tacoma yard will be in full production until the latter part of 1946.

Rivers and Oilers

Powerful Navy oilers soon to be built at Sausalito, California, shipyard of Marinship will be named for rivers in New York, Texas, Alabama and New Hampshire. There will be the USS Cohocton (meaning "trees in the water" in Indian); USS Concho ("shell" in Spanish); USS Conecuh (meaning "canebreak near" in Indian); and USS Contoocook (meaning "Crow River" in Indian).

These 523 feet long, turbo-electric oilers are being built for the U. S. Maritime Commission, which will subsequently turn them over to the U. S. Navy. Names are selected by the commission and four of these ships bearing the above names are scheduled for launching in June, July and August.

Contract for Orange, Texas Yard

Consolidated Steel Corporation has recently been awarded eight additional large destroyers for construction at its Orange, Texas, shipyard. These ships are a part of the new Navy construction program for combatant ships. This award brings to 35 the destroyers under construction at that yard and extends the program to January, 1947.

An interesting feature of this project is that the corporation is building at its Los Angeles plant the twin five-inch gun mounts that will be installed on the destroyers constructed at the Texas yard.

Consolidated has already delivered from the Texas yard: twelve 2100-ton destroyers; 106 troop landing ships; 93 destroyer escorts; and 75 barges.



Admiral's Daughter Launches Destroyer

Down the ways went the super-destroyer USS Buck on Sunday, March 11, as Miss Mary Nimitz, daughter of Fleet Admiral Chester W. Nimitz and Mrs. Nimitz, smashed a bottle of champagne against it's bow at Bethlehem Shipyard, San Francisco.

With paternal pride, the Admiral watched his 13-year-old daughter officiate, flanked by a half dozen schoolmates from the Dominican Convent at San Rafael. On her first try, the flaxen-haired Mary failed to break the beribboned bottle. In a split second she tried again and connected. Turning to her famous father she exuberantly exclaimed: "I did it!"

This new destroyer is the second in this war to bear the name of the Master's Mate James Buck, naval hero of the Civil War. Its predecessor was sunk by an underwater explosion off Salerno October 9, 1943. The first Buck had sunk an enemy submarine and rescued 45 members of the crew.

Graham Opens New Repair Yard

Graham Ship Repair Company has opened a new ship repair yard at the foot of Washington Street, Oakland, California. It has complete facilities and docking space for twelve vessels.



Fleet Admiral Chester W. Nimitz with Mrs. Nimitz at the launching of USS Buck, destroyer, when Miss Mary Nimitz acted as sponsor.

SOME PACIFIC COAST LAUNCHINGS

February 15 to March 15

Bethlehem Steel Company
Shipbuilding Division, San Francisco

USS Admiral Hugh Rodman (AP-2), Feb. 25
Destroyer USS Buck, Mar. 11

California Shipbuilding Corporation
Wilmington, California

SS Maryville Victory, Feb. 22
SS Norwich Victory, Feb. 24
SS Amherst Victory, Feb. 28
SS Baylor Victory, Mar. 6

Consolidated Steel Corporation, Ltd.
Long Beach, California

MS Sailor's Splice (AV-1), Feb. 24

Consolidated Steel Corporation, Ltd.
Wilmington, California

USS Presidio (CT), Feb. 17
MS Boatswain's Hitch (AV-1), Feb. 22
MS Reef Knot (AV-1), Feb. 27
MS Masthead Knot (AV-1), Mar. 9
MS Sword Knot (AV-1), Mar. 14



This Sea Mule built by Ingalls is shown towing a 6000 barrel barge off the Ingalls yard at Pascagoula, Miss. It is propelled by Hercules diesel engines developing 530 hp. It is capable of handling a fleet of barges, and is suitable for reasonably long distance tows, harbor work and use as an auxiliary booster tugboat.



1. Attack cargo ship USS Waukesha, built at Todd's Brooklyn division, recently commissioned.
2. Mrs. Bertrand O. Macomber of Alameda christening Marinship's Puente Hills.
3. USS Admiral Hugh Radman. Sponsor, Mrs. Sue Radman Merriman of San Francisco.
4. USS Admiral Hugh Radman sliding down the ways at Bethlehem-Alameda Shipyard.
5. Marinship's 75th launching paid tribute to the American Red Cross when the SS La Brea Hills was christened.
6. Sponsor's party at the Kaiser Company's Swan Island launching of SS Sunset. Mrs. George A. White, sponsor, had three Gold Star Mothers as attendants.

Everett Pacific Shipbuilding & Dry Dock Company
Everett, Washington
YF Barge 725, Feb. 15

Fellows and Stewart
Wilmington, California
J2250, Army Motor Launch, Feb. 15
J2251, Army Motor Launch, Feb. 24
J2252, Army Motor Launch, Mar. 5
J2253, Army Motor Launch, Mar. 14

Marinship Corporation
Sausalito, California
SS Puente Hills, Tanker, Feb. 17
SS La Brea Hills, Tanker, Feb. 24
SS Ventura Hills, Tanker, Feb. 25
SS Santa Maria Hills, Tanker, Mar. 3
SS Kern Hills, Tanker, Mar. 13

Western Pipe & Steel Co.
So. San Francisco Shipyard
SS Sea Starling (C-3), Mar. 6

The Permanente Metals Corporation
Yard One, Richmond, California
SS Princeton Victory, Feb. 19
SS Bowdoin Victory, Feb. 24
SS Wesleyan Victory, Feb. 28
SS Xavier Victory, Mar. 7

Commercial Iron Works
Portland, Oregon
AN 82, Feb. 17
LCS(L) 104, Feb. 17
LCS(L) 105, Feb. 17
LCS(L) 106, Feb. 24
LCS(L) 107, Feb. 24
LCS(L) 108, March 10

Kaiser Company, Inc.
Swan Island, Portland, Ore.
Hull 126, Sully Hill, Feb. 16
Hull 127, New Echota, Feb. 27
Hull 128, Muir Woods, March 9

The Permanente Metals Corporation
Yard Two, Richmond, California
SS Mt. Holyoke Victory, Feb 17
SS Duke Victory, Feb. 21
SS Fordham Victory, Feb. 24
SS Citadel Victory, Feb. 28
SS Berea Victory, Mar. 3
SS St. Lawrence Victory, Mar. 7
SS Central Victory, Mar. 10
SS Swarthmore Victory, Mar. 14

Kaiser Company, Inc.
Yard Three, Richmond, California
USS General D. E. Aultman (C4-S-A1), Feb. 21
USS General C. C. Ballou (C4-S-A1), Mar. 7

Kaiser Cargo, Inc.
Yard Four, Richmond, California
USS Faribault (C1-M-AV1), Feb. 24
USS Fentress (C1-M-AV1), Mar. 10

Everett Pacific Launches Last YF Barge

The YF Barge 725, a 260-foot all-steel freight barge, was launched February 14 at the Everett Pacific Shipbuilding and Dry Dock Company, Everett, Washington.

This barge is the last of eight turned out by the yard on a Navy contract. Four were equipped for Army ordanance, two as spare parts distribution centers and two as freight barges.

February Shipbuilding Record

Twenty-nine of the 125 ships built in merchant shipyards during February were turned over to the Army and Navy for military use, the Maritime Commission stated recently in announcing a total output of 1,300,340 dw tons in February. In addition one V3 type tug having no dw tonnage was delivered.

Nineteen of the vessels were constructed as military types and 10 were merchant-type ships turned over for military use. The merchant vessels delivered in February included 71 dry cargo ships, 20 tankers, and five minor types.

West Coast shipyards turned out the greatest number of ships and the largest percentage of total dw tons. They produced 55 vessels with an aggregate of 566,469 dw tons or 43.6 per cent of the tonnage.

Ship deliveries from U. S. Maritime Commission yards during February follow:

Shipyard	Number	Type
Alabama, Mobile, Ala.	5	T2 Tankers
Avondale, Westwego, La.	1	Coastal Cargo
Bethlehem-Fairfield, Baltimore, Md.	8	Victory Cargo
Bethlehem-Sparrows Point, Md.	1	Naval Tanker
Calship, Wilmington, Calif.	2	Military Type
	8	Victory Cargo
Consolidated, Wilmington, Calif.	5	Military Type
	3	Coastal Cargo
Corpus Christi, Corpus Christi, Tex.	1	V3 Tug
Delta, New Orleans, La.	3	Libertys
East Coast, Bayonne, N. J.	2	Naval Tankers, Coastal
Globe, Superior, Wis.	1	Coastal Cargo
Gulf, Mobile, Ala.	1	Refrigerated Cargo
Ingalls, Pascagoula, Miss.	1	Military Type
J. A. Jones, Brunswick, Ga.	4	Libertys
J. A. Jones, Panama City, Fla.	5	Libertys
Kaiser Cargo, Richmond No. 4 Richmond, Calif.	1	Coastal Cargo
Kaiser Co. Richmond No. 3 Richmond, Calif.	2	Military Type
Kaiser Co. Swan Island, Portland, Ore.	5	T2 Tankers
Leathem D. Smith, Sturgeon Bay, Wis.	1	Coastal Cargo
Marinship, Sausalito, Calif.	4	T2 Tankers
	1	Naval Tanker
Moore Dry Dock Co., Oakland, Calif.	3	C2 Cargo
North Carolina, Wilmington, N. C.	1	Military Type
	4	C2 Cargo
New England Shipbuilding, South Portland, Me.	6	Libertys
Oregonship, Portland, Ore.	9	Victory Cargo
Pennsylvania Shipyards, Beaumont, Tex.	2	Coastal Cargo
Permanente Metals Corp., Richmond, Calif.	11	Victory Cargo
St. Johns River, Jacksonville, Fla.	2	Libertys
Southeastern Shipbuilding Corp., Savannah, Ga.	3	Libertys
Sun Shipbuilding & D. D., Chester, Pa.	5	T2 Tankers
	1	Military Type
Todd-Houston, Houston, Tex.	7	Libertys
Walter Butler, Superior, Wis.	2	Coastal Cargo
Walsh-Kaiser, Providence, R. I.	3	Military Type
Welding Shipyards, Norfolk, Va.	1	T3 Tanker
Western Pipe & Steel Co., San Francisco	1	C3 Cargo

Portland-Vancouver Area Starts Its Second Thousand Ships

The 1001st ship to be launched in the Portland-Vancouver area was sent down Commercial Iron Works' famed marine railway into the Willamette River at noon, Saturday, March 10. And that made two firsts for the Portland shipbuilding firm on the 22nd of February in 1941 they launched the first ship in the war program—the net tender, USS Catalpa. Oddly enough, this 1001st ship was the LCS(L) 108, last of a series of 52 which CIW started building in July, 1944.

Vessels of 250 displacement tons or larger launched since January 1, 1941, and included in contracts held by local shipbuilders, up to March 10.



LCS(L) 108 last of a series of 52 craft built at Commercial Iron Works, Portland, Oregon.

	Launched to Date	Under Contract to Launch
Albina Engine & Machine Works	116	25
Commercial Iron Works	169	4
Oregon Shipbuilding Corp.	413	59
Kaiser-Swan Island	122	30
Kaiser-Vancouver	122	34
Willamette Iron & Steel Corporation	58	3
Gunderson Brothers Engineering Corp.		10
	1000	165

Sealed Bids for New Tankers

The largest single invitation issued since 1941 for sealed bids for the construction of 24 new 230-foot single screw diesel-powered tankers was announced late in February by the U. S. Maritime Commission.

Plans and specifications called for a model which will be known as the "T1-M-BK1" type. Bids were returnable March 14, 1945, and construction schedule, upon which the bids were conditioned, called for completion and salt-water delivery at an East, West, or Gulf Coast port not later than December 31, 1945. Each bid had to be accompanied by a guaranty of $25,000 to insure execution of the contract.

A Fine Safety Record

The Ingalls Shipbuilding Corporation yard at Pascagoula, Mississippi, has completed an entire year without a single accidental death. This record was established while more than 12,000 employees were working approximately 25,500,000 man-hours on big all-welded attack transports on which the yard has been concentrating.

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
MARINE UNDERWRITERS
200 BUSH STREET . . . . . SAN FRANCISCO
Offices at: Colman Bldg., Seattle • 111 West 7th St., Los Angeles

YOUR PROBLEMS ANSWERED

Continued from page 235

wear as evidenced by copper dust in and about the machine.

The selection between film-forming and polishing action is a matter of operating conditions and atmospheric contaminations.

The same machine may require a film-forming brush when operating at light loads in a clean, dry atmosphere and a polishing or film-removing (film-controlling) brush when at full or overloads or oil vapor or atmospheric poisons are present.

Some of the disturbing facts will be discussed in the next issue.

STEADY AS YOU GO!

Continued from page 237

necessary to use the course recorder chart as evidence in case of accident, collision or stranding. Should there be any difference between ship's time and course recorder time, this difference would have to be proved to the satisfaction of the court or else the record would have no value as evidence. Remember, therefore: check the recorder time with the ship's time at the beginning of each watch and note any error on the recorder chart. If necessary, reset the time and make a note of this on the chart. On the latest model course recorder a vernier scale, calibrated in minutes of time, has been added in order to improve the accuracy with which the record can be read.

Figure 23 shows how notations are entered on the course recorder chart. The record is read from the bottom upward in accordance with the hour notations on the left. It will be noted that at 10 p. m., with a moderate breeze and an easy beam swell, the weather adjustment was set at ½, and the rudder adjustment was set at 1½. Steering was fair, deviations being within the limits of 1°. Better steering would have resulted had the weather adjustment been set at 0, a position suited to mild weather.

At 12:21 a. m. the weather adjustment was set at 0 and the rudder adjustment was set at various positions between 1 and 3. Steering was poor, due to excessive rudder adjustment. At 1:26 a. m. the rudder adjustment was returned to 1½, with the weather adjustment remaining at 0. Steering was good, deviations being within the limits of ½°.

Notations made on the record, of ship designation, weather and sea conditions, speed, roll, weather and rudder adjustments, etc., will be found to add greatly to the reference value of the chart. These notations should be made on the chart by the deck officer during each watch.

(To be continued)

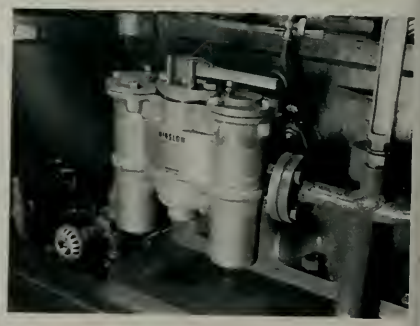
Magnetic Strainer For Lube Oil

Winslow Engineering Company of Oakland, California, announces a new magnetic-type strainer which incorporates a number of important design improvements, and is the result of an increasing demand for simplification of such equipment.

For use in the lubricating oil lines of steam turbines, or other power equipment to remove filings and metal particles through the combination of magnetic action and screening, the strainer combines in one unit the by-pass valves, pressure regulator, main control valve, and the two strainer elements in which powerful magnets are located. A quick-acting hand-operated three-way control valve permits the change of flow from one strainer element to the other, or through both elements. The flow control valve has been greatly simplified and requires no jacks to lock it in place. Adjacent to this three-way valve is the pressure regulating valve for adjustment of outgoing oil pressure.

The Model 200-MS-1 Winslow Duplex strainer is of either cast bronze or iron for the one-piece body which incorporates the manifold, the strainers, inlet and outlet connections. The two cylindrical baskets are constructed around a main body of perforated steel, within which are fine wire mesh linings. The magnets are suspended within the baskets.

In the body is located a spring-loaded by-pass valve that may be adjusted from the outside. The Model 200-MS-1 is designed to handle 15 gpm. A larger model to handle 40 gpm is also available. Where finer filtration of the lubricating oil is necessary, Winslow cartridge-type oil conditioners may be used in conjunction with the strainer. These magnetic strainers are now in production and are standard equipment on the new Hendy turbo-generator plants.



The Winslow magnetic strainer, standard equipment on the new Hendy turbo-generator plants.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

Navy's Seabees and Marine Painting Share Honors

The attendance at the unveiling of a magnificent marine painting by Lieutenant Hunter Wood, held at the Marine Exchange in San Francisco, was made up of a large percentage of the City's shipping fraternity. The painting depicted the rescue by the U. S. troopship, SS Monterey of 1675 troops from the torpedoed troopship, SS Santa Elena.



The Artist:
Lieutenant Hunter Wood, USMS

The exhibit, with other paintings by the artist, was arranged by the U. S. Merchant Marine Cadet Basic School at San Mateo where the picture has been hanging in Matson Hall.

Following the ceremony at the Marine Exchange, the Propeller Club staged a highly successful luncheon meeting. Along with officials of the Monterey to be honored were the Navy's famous Construction Battalions, known the world over as the "Seabees." Included among the guests at the speakers' table was Lt. Comdr. J. A. Stewart, a recently returned Japanese prisoner.

An illustrated sound picture was shown entitled "The Fighting Construction Men," with an explanatory talk by Captain H. R. Patterson, USN (Retired), Liaison Officer for the Seabees.

"Rescue by the United States Troopship SS Monterey"

A painting by Lt. Hunter Wood, U S M S.









Left: Captain William K. Scammell, USCG, new District Coast Guard officer, 12ND. Center: Representing 112 years of service. These three veteran of the Coast Guard, now retired, are Captain Fisher, Rear Admiral Philip Roach and Captain Harry W. Rhodes, former Superintendent of Lighthouse U. S. Coast Guard. Right: Thomas A. Short, president of Mariners Club.

District Coast Guard Officer Retires

After 41 years of service, Philip F. Roach, District Coast Guard Officer for the 12th Naval District since April 12, 1942, retired March 1 with the rank of Rear Admiral. He was succeeded by Captain W. K. Scammell, USCG, formerly District Coast Guard Officer in the 8th ND.

Roach was appointed an ensign in the USCG by President Theodore Roosevelt upon his graduation from the Coast Guard Academy in 1907. In 1916 he was attached to the Staff of the Commandant, Coast Guard Headquarters in Washigton, D. C., and, with the advent of World War I, saw combat aboard Naval vessels in European waters.

His service aboard the USS Tampa, later lost in action, the USS Manning, and as commanding officer of the USS Lydonia, won Commodore Roach the coveted Navy Cross. Following the war, with intermittent sea duty, he again served on the Commandant's staff. He was appointed Captain on May 25, 1938, served as President of the Coast Guard General Board from 1938 through 1942, and on April 12, 1942, was assigned to the Staff of the Commandant, 12th ND, as District Coast Guard Officer. He was appointed Commodore by President Roosevelt in June, 1943.

During his service as District Coast Guard Officer, the Commodore has seen his duties increase four-fold. Heading one of the most important Coast Guard war districts in the country, he is responsible for the fine record set by the Coast Guard in port security.

Captain William Kirk Scammell, who will assume the post, is a veteran of 37 years service and a graduate of the Coast Guard Academy. When the war began he was commanding officer on the USS Wakefield, famous Coast Guard transport. He was placed in command of the Coast Guard Training Station, St. Augustine, Florida, in October, 1942, and in November, 1943, assumed his last post before coming to San Francisco, that of District Coast Guard Officer of the 8th ND in New Orleans.



Walter Bradshaw of the Matson Navigation Company discusses a post-war merchant marine problem with Captain Paul Cronk, USCG, Captain of the Port, during the dance given at the United States Merchant Marine Cadet School, San Mateo, by the Student Propeller Club of the base. The formal dance was given on February 10.

Commodore Stedman Guest at Pacific Coast Propeller Ports



Commodore Giles C. Stedman, USNR, superintendent, U. S. Merchant Marine Academy, Kings Point, N. Y., a recent visitor to the Pacific Coast.

S. F. Propeller Club Honors Stedman at Reception

Commodore Giles C. Stedman, USNR, superintendent of the U. S. Merchant Marine Academy at Kings Point, N. Y., and former master of the largest vessels in the American Merchant Marine, was feted by the San Francisco Propeller Club at a shipping, Navy and Merchant Marine reception held in his honor in the Green Room of the St. Francis Hotel on March 6.

Commodore Stedman last visited San Francisco when, as commodore of the United States Lines, he commanded the liner SS America, now USS West Point, on her maiden voyage to San Francisco in February, 1941. On that occasion, one of the most colorful days in San Francisco maritime history, the 30,000-ton queen of the American merchant fleet was berthed at Pier 35 on The Embarcadero and opened to the public to visit. The former America was christened by Mrs. Franklin D. Roosevelt at Newport News, Va., in November, 1940.

At the time of Pearl Harbor the America was 500 miles south of Cape Town dodging the subs. The commodore, one of the most popular masters in the Merchant Marine, remained aboard the SS America when his ship was taken over by the Navy to become the troopship USS West Point. He was decorated by the Navy for participation in the evacuation of Singapore during the height of the Jap attack following Pearl Harbor. Prior to commanding the America, he was master of the SS Washington of the United States Lines fleet.

While in San Francisco he inspected the Maritime Cadet School, San Mateo. He was made superintendent of the national academy in October, 1943.

Los Angeles-Long Beach Propellers Honor Stedman

One of the best attended meetings of the Propeller Club, Port of Los Angeles-Long Beach was held recently at the Ambassador Hotel. Commodore Giles C. Stedman, superintendent of the United States Merchant Marine Academy, Kings Point, L. I., was the principal speaker and guest of honor.

At the luncheon honoring Commodore Giles C. Stedmon (left) held by the Propeller Club, Port of Los Angeles-Long Beach, are Rear Admiral A. W. Marshall, USN, retired; Lee Vermille, president of Club, and L. E. Archer.







Left to right: A. S. Moody, J. R. Murphy and Allen C. Jones all of General Electric Co. Pacific District Division.

General Electric Shifts

Under a new setup recently inaugurated by the General Electric Company, the following shifts of personnel were effected: **Raymond M. Alvord,** commercial vice president and manager of Pacific District, was appointed a member of the president's staff; **Allen C. Jones,** Pacific District of Central-Station-Transportation Dept., was appointed manager of apparatus sales in California, Arizona, Western Nevada, and Hawaiian Islands; **A. S. Moody,** commercial vice president and manager of General Electric Company's Northwestern District, Portland, was appointed a member of the president's staff; and **J. R. Murphy,** formerly special representative for General Electric in Washington, D. C., was transferred to Portland to take over as Northwestern district manager of apparatus sales.

Mr. Moody will continue to make his headquarters in Portland and Mr. Alvord will maintain his office in San Francisco. E. O. (Bill) Shreve, vice president in charge of customer relations, New York, and well known on the Pacific Coast, heads the newly created presidential staff.

R. M. Alvord



Matson Executive Changes

W. P. Roth, chairman of the board of directors of Matson Navigation Company, announced that at a meeting of the Board of Directors of the company held March 16, executive changes in contemplation of the enlarged post-war operations of the company were made effective.

Mr. Roth, who has been president of the company for the last 18 years, retired as president of the company and was elected Chairman of the Board, a position that has been vacant since the death of **E. D. Tenney** in 1934.

F. A. Bailey was elected president of the company to succeed Mr. Roth. Mr. Bailey has been executive vice president of the company and has served with it in various capacities since 1910.

The Board of Directors created a new office, Chairman of the Executive Committee, and elected **George G. Montgomery** to that position. Mr. Montgomery has been a director of the company for the past ten years. In addition to devoting substantial time to the duties of his new position, he will continue as vice president of Castle & Cooke, Limited, in charge of its San Francisco office.

Mr. Roth pointed out that the post-war plans of the company contemplate not only the reestablishment of its prewar services but also their enlargement and modernization.

Frazer W. Bailey, President of Matson Navigation Co.









Left, left to right: Neil E. Brown, treasurer of Port of San Diego; K. M. Walker, vice president; Wallazz Eaton, vice president; Charles R. Goff, president of new port; Shelby Wiggins, secretary; Lee K. Vermille. Head table at the Charter presentation dinner in San Diego.

Top: Lee K. Vermille, national vice president congratulates Charles R. Goff (left) Port of San Diego's new president.

News From Various Propeller Club Ports

Port of San Diego held its charter presentation party March 13, with sixty-five charter members. On this occasion Lee Vermille, national vice president and president of the Los Angeles-Long Beach Port, supported by a platoon of members of that area, made the charter presentation. The officers of the new port are Charles R. Goff, president; Wallazz B. Eaton, vice president; K. M. Walker, vice president; Shelby Wiggins, secretary; Neil E. Brown, treasurer. On the second Tuesday in May the regular meetings will commence.

Port of Port Everglades, Florida, Chartered in February

In the presence of 150 guests and members of various Propeller Clubs, A. W. Allison, national vice president of the Propeller Club, Charleston, S. C., presented a charter to Fred Stewart, president of the Propeller Club embracing the Port Everglades area (Port No. 94), at a dinner dance held at Hollywood Country Club, Hollywood, Florida, February 19. The new officers include Sigfried Bechhold, first vice president; Floyd L. Wray, second vice president; James E. Gallagher, secretary; and the Board of Governors, R. T. Spangler, Warren T. Eller, B. Brack Cantrell, Frank Stirling, James Breeding and James Mack.



PROPELLER CLUB
PORT OF PORT EVERGLADES, FLORIDA

Standing, left to right: Grover Theis, secretary of the Miami Propeller Club; Warren T. Eller, James M. Breeding, James F. Mack and H. T. Spangler, all members of the board of governors of the new organization; Sigfried Bechhold, first vice president; James E. Gallagher, secretary; Charles E. Albury, installing officer and past president of the Miami Club; Fred J. Stewart, president, and James D. Camp of Fort Lauderdale, toastmaster.

Seated: Mrs. Albury, Captain and Mrs. Philip H. FitzGerald, A. W. Allisan, National Vice President of Propeller Clubs; Mrs. Allisan and Mrs. Camp.



150 YEARS OF EXPERIENCE!

Left to right: Ray Jones, port engineer, General Petroleum Corporation; Jack Govan, the host, and Joe Hare, manager of Maintenance and Repairs of War Shipping Administration in Southern California.

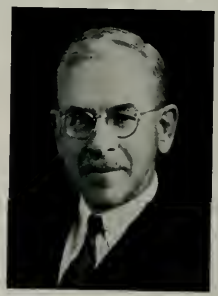
Jack Govan Host At New Plant's Opening

A notable group of Southern California maritime executives were recently the guests of J. F. Govan, president of the Saverite Engineering Company, for an inspection of the firm's new Los Angeles plant. The visitors saw "Brickseal" refractory coating being applied to brick, then placed in a retort and heated to approximately 2470 degrees F., at which point the brick was removed from the retort and dropped into cold water with no noticeable damage to either the brick or the coating.

Among those present at this Saverite plant inspection were Joe Hare, manager of maintenance and repair for War Shipping Administration in Southern California; Fred Cordes of Deconhil Steamship Company; Ray Jones, port engineer for General Petroleum Corporation; Paul Gaudin, superintendent, Los Angeles Tanker Operators; Frank Cavanaugh, general manager, West Coast Shipbuilding & Dry Dock Company; Bert Hale, Pacific Coast Tankers; A. M. Rosenfeld, president of the California Association of Port Authorities; C. G. Reed, port engineer of Richfield Oil Corporation; L. E. Landers, port engineer, American President Lines; Floyd Nelson, marine department, The Texas Company; David K. Steward, president, Pacific Marine Surveys; Rolf Monsen, Todd Shipyards Corporation; and Lieut. Ed. Kendall, U.S.N.

"Brickseal" protected brick comes out of demonstration retort, explained to an interested group by Bill Rudy of Xzit.





George L. Sargent, recently transferred to head office of Fireman's Fund Insurance Co.

George L. Sargent, formerly claims agent for Grace Lines in New Orleans, until November, 1944, recently joined the Marine Department of Fireman's Fund Insurance Company, and was transferred to the head office in San Francisco the first of this year handling P & I claims.

Prior to the war he was in San Francisco associated with the old Pacific Mail and until 1938, was freight claims agent with Grace in San Francisco.

His hobbies are trail blazing and organizational end of the Boy Scouts of America. He is a member of Organization and Extension Committee, Berkeley-Contra Costa Area Council of the Scouts.

Mr. Sargent's daughter, Eunice May, is an aerographer with the Spars, stationed at Port Angeles, Washington, and of whom Mr. Sargent is very proud.





At the Directors and Past Presidents table you see, left to right: Joe Castello, William Harrington, Howard Hartry, E. L. Archibald, Chairman, T. W. Buchholz, R. W. Decker, Al Boro, Tom Forster, Art Pegg, Albert O. Pegg and Captain Thea. Peters.

BILGE CLUB'S ANNUAL STAG

Pacific Marine Review salutes the Bilge Club on its 17th annual banquet held at the Biltmore Hotel, Los Angeles. Cheers for this successful party go to the committee chairmen: President T. W. Buchholz; R. W. Decker, A. F. Boro, Floyd Nelson, William Harrington, E. L. Archibald, Howard Hartry, Robert Snodgrass, Winn Rash.

Top, right: R. G. VondenBoam introduces Joe Hare to W. R. Crusoe of Union Metal Manufacturing Company, a dinner guest from Canton, Ohio. Jim Henry provides the big smile in background.

Center: Efficient and busy secretary, Robert Snodgrass, takes ticket from guest, Carroll Johnson.

At bottom: Left to right: C. Bailey, Lt. Comdr. E. A. Flinn, Lt. Comdr. W. A. Meacham and Charlie Lee.







At left we find in this group some of our old friends and Bilge Clubbers. Lt. Comdr. H. E. Keller, Rusty Fellows, Elmer L. Decker, Paul Faulkner, Ed Dolan, M. W. Hollinger, Lt. Comdr. C. A. Farrow, Arthur Woll and Jim Smith.





Top, left: Guest of Honor, Monroe W. Jackson (left), with his maritime associates at Dugan's Cafe prior to leoving for Manilo. John A. McKown (center) is chief of the construction and inspection section of regionol office. Paul N. Mulvony replaces Jockson as assistant to McKown.



Left: ot the dinner honoring Jackson ore T. A. Laird, senior hull inspector; Morris Chomberlain, principal machine inspector; George W. Avan, senior machine inspector, and J. L. Loper, senior machine inspector.

(Photographs courtesy of Oakland Post Enquirer.)

Monroe Jackson Goes to the Philippines

Manila bound!

That was the slogan of Monroe W. Jackson, who recently relinquished his duties as assistant chief of the ship construction and inspection section of the West Coast regional office in Oakland of the U. S. Maritime Commission.

In government service almost continuously since 1911, Jackson has been in the Oakland Commission office since October, 1940, first as electrical inspector coordinator and, since the formation of the regional office, in the assistant chief position.

Ordered to Manila in the wake of liberating troops to take over an important position with the War Shipping Administration, he was honored by 125 of his associates at a stag dinner at Dugan's Cafe in Emeryville, California.

Paul N. Mulvany, formerly principal machinery inspector at the Kaiser Company, Inc., shipyard at Vancouver, Washington, who will take over Jackson's duties in the Oakland office, was officially introduced at the dinner.

Mr. Jackson became associated with the Navy Department in 1911 at the Norfolk Navy yard. In 1924 he was transferred to the Cavite yard at the large Philippine naval station, where he was master electrician for the 16th Naval District.

Returning to the United States in 1934, he worked for Newport News Shipbuilding Co., as a navy inspector at the Bethlehem yards in San Francisco, for the Standard Fruit Co. in Nicaragua, and the Maritime Commission as senior electrical inspector at Tampa, Florida.

Structural Engineers Visit Shipyard

One hundred and five members of the Structural Engineers Association of Northern California and the American Welding Society of San Francisco visited the Bethlehem-Alameda Shipyard, Inc., and the Bethlehem Steel Fabricating Plant during the night of February 23, to inspect modern shipyard welding methods.

Prior to the inspection tour, the engineers as guests of the American Welding Society heard a brief talk on "Welding Problems of the Structural Engineers," by R. E. Gauthier, district engineer of the Bethlehem Fabricating Division.



Enjoying dinner and program ot the stag dinner were, left to right: Earl S. Shulter, technicol assistant to director; L. W. Manot, chief of coast review section; B. L. Newhouse, traffic division; C. L. Miller, chief of personnel. At right, they inspect the craft. Left to right: Ben Colombo, senior hull inspector; John Hamilton, principal hull inspector; Jack Hornby, first senior inspector; T. A. Laird, senior hull inspector, and Frenchie Ballord, shipyord inspector.

The odds are 4000 to 1

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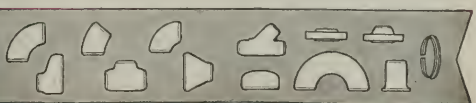


years of successful experience are at your disposal to help solve difficult problems. And back of him, ready to help at a minute's notice, are the nearest Tube Turns factory branch and the complete engineering staff and facilities of the Tube Turns factory in Louisville.

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S. J. JUMPY SIDES

Works Manager, California Shipbuilding Corporation

"War Makes Geniuses"

By Albert O. Pegg

Technical Consultant, California Shipbuilding Corporation

When the word war is mentioned, we immediately associate it with destruction, fire, poverty and death; however, when we search around we find isolated instances where genius has been created.

Perhaps after peace comes and we are on our way back to normal activities and operations, we shall hear of many acts of genius due to the war efforts. However, it is my pleasure at this time to bring forth a creation of geniuses which in my opinion is most outstanding.

Nearly five years have passed since ground was broken at Terminal Island for the construction of California Shipbuilding Corporation's yard and among those involved in the construction was one individual—**J. S. "Jumpy" Sides.** Yes, Jumpy is his nickname and the one by which we all know him best so it will be Jumpy during the rest of this article.

Jumpy was born in Black Lick, Pennsylvania, and educated at Allegheny College and Carnegie Institute of Technology at Pittsburgh, Pennsylvania. Pittsburgh being a great steel center it gave Jumpy his first love,—"steel construction."

After serving about four years with the great steel firm Jones & Laughlin of Pittsburgh, as superintendent of construction on some big, tough jobs, Jumpy concluded that steel construction was a most interesting career and decided to make it his life's work.

About ths time the great Boulder Dam project was in the making and he saw an opportunity to do bigger and greater things in steel. In May, 1933, Jumpy made connections with Babcock & Wilcox Company at Boulder City, and became superintendent of erection of the great steel tunnel sections which were fabricated on the job. Any one who visited the Boulder Dam project during its construction made it a point to see the fabrication, handling and erection of these great tunnel sections, a job only Babcock & Wilcox would undertake.

Jumpy stayed with this job until its completion and then returned to Rust Engineering Co. at Pittsburgh. He remained with them as superintendent of construction until the war broke out, and after a short vacation came West determined to do bigger and better things in the line of steel construction.

Los Angeles was Jumpy's stopping off place in the West. This was in July, 1941, and shipbuilding was the principal item of construction and the largest unit under fabrication at that time.

The California Shipbuilding Corporation's yard at Terminal Island was then nearing completion but already the first hull, the John C. Fremont, was being erected on Way No. 1. The sight of this magnificent steel structure was awe inspiring to Jumpy and he resolved to become a part of its making. Although shipbuilding was not a part of his past experience, the magnificence of the structure inspired him to the point of determination that what man has done, man can do.

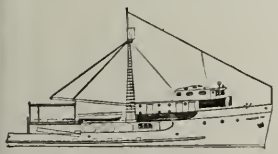
He immediately applied for a position of responsibility and was appointed superintendent of hull construction on swing shift, at that time employing 6,000 men. Steel in any shape or form was no problem to him but when he was confronted with such terms as sheer strakes, moulded lines, transom plates and bilge keels, he knew he had a problem to handle and to be successful he knew he had to learn quickly. Well, from here on the story is almost the history of the yard itself.

In October, 1941, Jumpy was made Assistant Production Manager in charge of the Hull and Yard Department. He held this position for about five months, which could be termed a probationary period in shipbuild-



LOOK Magazine

Saving time there · · · and back



It's a long haul for tuna—to Costa Rica and back!

So, when Otto Kiessig and Associates ordered two of the new-type, long range tuna clippers from the Consolidated Steel Corporation, they made sure the vessels would make the long run pronto.

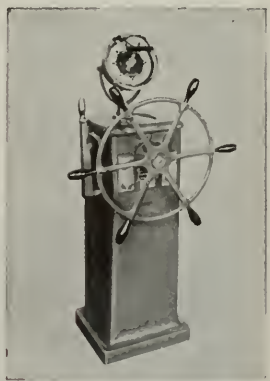
These new all-steel, all-welded clippers, the Princess Pat, and Princess Anne, fishing for Sun Harbor Packing Company of San Diego, are being equipped with Sperry automatic steering.

These are the first ships of this general type to have Sperry Gyro-Compasses and Sperry Gyro-Pilots. As a result it is expected that at least a day will be saved on each trip—a mighty important saving both to owners and crews, and to Uncle Sam, who needs every extra pound of fish the industry can produce.

With the Gyro-Compass to set an accurate course . . . and "Metal Mike" to steer that course automatically, the Princess Pat and Princess Anne will leave behind them straight-as-a-die wakes that mean double economy: Time saved . . . Fuel saved.

"Metal Mike" will also relieve the crew of much of the tedious work of fighting the wheel—a special advantage in rough weather. And to complete the picture, these new clippers also will be equipped with Sperry Electric Steering Engines, and remote control on each bridge wing for ease in maneuvering and docking.

The Princess Pat and Princess Anne exemplify the modern trend in fishing craft. When you order new ships, be sure to specify the Sperry Gyro-Compass and Sperry Gyro-Pilot.



Sperry Gyroscope Company, Inc. GREAT NECK, N. Y.

Division of the Sperry Corporation

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ing. In March, 1942, he was made Production Manager in full charge of the Hull and Yard Department.

It was during this period that Calship began to make history in the shipbuilding world. Liberty ships began to leave the yard in quantities never before heard of. It was in June, 1942, when Calship delivered 15 Liberty ships,—a world's record. At this time Jumpy had some 19,000 men working in the Hull and Yard Department.

In September, 1943, Jumpy advanced to the position of Works Manager which covered the yard as a whole and he then had 40,000 men under his supervision. In December, 1943, Calship with Jumpy as Works Manager delivered 23 vessels including four Liberty type tankers.

Calship completed its Liberty ship program and started the construction of Victory and Troop ships. Both the Troop ship and Victory ship were very complicated in design and their construction was a serious problem to any old-line experienced shipyard, but Jumpy gloried in tough jobs, particularly those of steel, with the result that Calship again delivered the goods on time.

At present Calship is building the streamlined AP2 type of Victory ships and will continue to do so until the end of 1945. Not only have these ships been streamlined but in addition the manhours and cost of building them are equal to any of the lower cost yards on the Pacific Coast.

In visualizing the enormous job ahead of him Jumpy recognized the fact that he must surround himself with competent help in the top positions necessary in such a large production program. This has been accomplished at Calship. It is my pleasure to say a few words of the fine group of men so ably assisting Jumpy in this great job.

Jerome William Komes, Assistant Production Manager — a brilliant young man who took to shipbuilding like a duck to water. A good planning expert if ever there was one.

Elmer Casey, Manager of the Shops and Skids—Elmer comes from good Irish stock and work is his favorite sport. The great sections of steel units you see around the shops and skids are the products of Elmer and his staff.

John Rocke Kiely, Manager of Outfitting. John is another young man with a liking for shipbuilding. He was born in Berkeley, California, and educated at the University of Washington, majoring in Civil Engineering. John looks the part of a good shipbuilder and the fine outfitting job being done is a credit to his skill.

William Carleton Ryan, Chief Engineer and member of the Operating Committee. "Pat" as we all know him, was born and educated in Massachusetts. He majored in Naval Architecture and Aero Engineering at the Webb Institute of Naval Architects. Since graduating from college, Pat has had considerable experience at the Bureau of Ships, Washigton, D. C. He felt right at home as coordinator of the 30 troopships built



THE AUTHOR

"Bert" Pegg is one of the best known marine engineers on the Pacific Coast, having been 36 years with Union Oil as superintending marine engineer. He came out of retirement in 1941 to became manager of outfitting, then assistant general manager and now technical consultant of Calship.

at the yard. Pat, in order to make himself available for calls to Washington, D. C., when necessary, had attached two very brilliant men to his staff. They are **Dave Charles,** design and marine engineer and acting Chief Engineer in Pat's absence, and **Carl Rettig Jr.,** Chief Draftsman, Hull Division. Both of these men have had considerable shipbuilding experience.

Rolland Stuart Allen, Manager of Hull Department—"Stu" is what we call him. He was born and educated in Mobile, Alabama. Stuart is just 36 years of age but has had considerable experience in construction work although most of his experience has been in wood, his transition to steel work was very skillfully accomplished and all those who have witnessed launchings at Calship have seen examples of his skill.

John Price, Assistant Manager of Hull Coonstruction — Jack, as we know him, has been in the shipbuilding trade in all its branches over a long period and his wide knowledge of shipbuilding has been applied here at Calship. You should have seen Jack perform in December, 1943, when we delivered 23 ships.

Bernard Leroy Morgan, General Superintendent of Hull Construction —Bill has had considerable experience here in Southern California in construction work and when he tackled ship construction he adapted himself in an excellent manner and is doing a fine job.

Thomas James Leahy, General Superintendent of the Pipe Department —Tom has had a world of experience in pipe fabrication and installation. The extraordinary jobs of installation here at Calship have been a pleasure for him. He has surrounded himself with several good men such as **Lou Berray, F. D. Robinett, L. J. Wright, R. C. Jones** and **I. B. Berg.**

Noble Lorain Mille—General Superintendent of Marine Electric. Millie has had considerable engineering training and is a graduate of U. S. C. in General Engineering. The technicalities of Marine Electric work were quickly absorbed into this trained mind and a fine installation job is being done.

Edgar M. Kell, Manager of Facilities. Ed graduated from the University of Nevada in Mechanical Engineering. Ed's job is to keep the facilities up-to-date and ready for any emergency and in addition he has taken on the job of Thermit Welding all stern frames and stern pieces. It is a pleasure to watch this work being done.

John F. Gravdon, General Superintendent of Sheet Metal Department. Jack was born in Dublin, Ireland. He was educated in the City of Dublin Technical School and made sheet metal his life's work. The best example of Jack's ability as a sheet metal man would be to visit any of the troopships turned out by Calship. Jack also has three able lieutenants working with him, **Mike Harrington, S. S. Vitale,** and **E. A. Johnston.**

Edward Louis Misippo, General Superintendent of Machinery. Louie has been handling marine machinery all his life and comes from a family of marine machinery men. His father was the dean of marine installations. Installation of high pressure, high temperature machinery calls for expert handling and Louie has just that.

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LOS ANGELES

James Lewis, Superintendent of Launching. Jim is an old timer in the building and launching of ships. His knowledge has been a great asset to Calship. Jim has launched 420 at this yard and over 100 ships at other yards.

Lewis Ray Miles, Superintendent of Painting. Ray knows the paint business in all its branches and turns the Calship vessels out in first class condition, well protected with adequate paint.

Meredith Hall MacKusick, Welding Engineer. Mac keeps us in line on good welding practice which is the result of his education, Harvard Engineering School in which he majored in electrical engineering.

In conclusion let me say that at the beginning of activities at Calship very few of these men had any shipbuilding training. However, after four years of record breaking shipbuilding performance we can be assured of our future in shipbuilding personnel.

LA Propeller News

The Port's Education Committee, headed by Chairman Rear-Admiral Albert Ware Marshall, U.S.N. (retired), introduced guests for the University of Southern California where another Port is soon to be established. Attending the meeting as representatives of U.S.C. were Professor R. M. Fox, Dr. Garrett Wynkoop, John R. Bodin, R. E. Henning and P. L. Howard. A complete announcement of the U.S.C. "Port" will be ready soon.

Serving on Rear-Admiral Marshall's Educational Committee are A. L. Allyn, J. D. Baker, C. A. Bland, Fred A. Hooper, S. T. Olafson and capable and busy Secretary Howard Woodruff. President Lee K. Vermille and Secretary Woodruff are to be congratulated on the widespread interest generated in the newly launched 1945 Propeller Club program.



In top row, left to right: Dr. Garrett Wynkoop, U. S. C.; John R. Bodin, U S. C.; R. E. Henning, U. S. C.; P. L. Howard, U.S.C. Seated: A. L. Allyn; Professor R. M. Fox of U. S. C.; Commodore Stedman and L. K. Vermille, president, Port of Los Angeles-Long Beach.

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E. E. Johnson

Shipping Expert Shot

The bitter news of **Ernest E. Johnson's** death came as a great shock to Pacific Coast shipping circles. Just before the tragic news reached Mrs. Johnson she had had word through George J. McCarthy, former manager of American President Lines at Manila and a repatriated internee, that Johnson, despite two years spent in a Jap prison camp, was alive and well.

Their son, Thor Johnson, Lt. (j.g.) U.S.N., who was in the Philippines with the American forces, searched tirelessly for his father. He discovered his grave in Santo Tomas prison camp and subsequently learned that his father was executed by the Japanese on January 15.

Johnson, who went to the Orient in 1936, was well known in steamship circles of the Pacific Coast. Formerly employed by the General Steamship Corporation, he went with Sudden & Christenson, Inc., in 1931. Later he joined the Dollar Line and subsequently became United States Maritime Commission representative for the Orient. His headquarters were in Hong Kong, until September, 1941, when he moved to Manila.

He is survived by his widow, Elise, who resides in Burlingame; a daughter, Barbara; two sons, Thor and Thomas, and his brother, Alfred, of General Steamship Corp., San Francisco.

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TRADE NOTES

Matson Joins With United Engineering

United Engineering Company, Ltd., through its President, **Robert E. Christy,** announced that Matson Navigation Company had acquired a substantial interest in United. Matson will have representation on the Board of Directors but no change in active management of United will be made.

American Hoist & Derrick Company Elects Officers

In January, the Board of Directors of the American Hoist & Derrick Company of St. Paul, Minn., elected the following officers: Frederick Crosby, chairman of the board; Harold O. Washburn, president; Rolf E. Ljungkull, vice president of engineering; Donal B. Botkin, vice president of manufacturing; Stanley M. Hunter, vice president of sales; James F. Bishop, secretary and assistant treasurer; and Robert J. Henry, assistant secretary.

International Safety at Sea Conference

Five San Franciscans, all prominent men in the maritime industry, have been appointed by Coast Guard headquarters in Washington, D.C., to special technical committees which will make recommendations to the State Department for an American agenda to be used in a post war international conference on safety at sea.

The five are: **T. E. Cuffe,** vice president, American President Lines; **A. T. Stow,** operating manager, American-Hawaiian Steamship Co.; **Capt. C. W. Hawkins,** marine superintendent, American President Lines; **Joseph A. Lunny,** vice president, Pope and Talbot, Inc.; and **Joseph Geary,** of Lillick, Geary, Olson and Charles.

PEC Appoints Manager

Pipe Engineering Company, Stockton, California, has appointed **James E. Guillet** operations manager. Guillet was formerly pipe maintenance superintendent and pipe construction foreman at Pollock-Stockton Shipbuilding Co., after 12 years administrative and sales experience with nationally known firms. He is regarded as being well versed on Government projects procedure.

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Pacific Coast Ship Chandlers Association Annual Meeting

The annual meeting of the Pacific Coast Ship Chandlers Association was held in San Francisco, at 255 Mission Street, on February 21, with a very large attendance. C. K. Howe was re-elected president for the 12th year and I. C. Freeman was re-elected secretary and treasurer for the ensuing year.

Fruehauf Acquires Trombly

The Western division of Fruehauf Trailer Company has just announced the purchase of Trombly Truck Equipment Company, Portland. This new addition to the firm's facilities in the northwest is part of an overall western expansion program planned to increase service to users of trailers. The Trombly shops will operate in conjunction with Fruehauf's present Portland plant.

Shoreside Personalities

Captain Lester G. Bock has just taken charge of the Portland branch office of the assistant to the Navy's industrial manager. He is in charge of ship repair and conversion work in the Portland area. Prior to his present appointment Captain Bock was attached to the Astoria naval station, where he supervised the navy's alterations and the installation of radio and radar equipment on the Maritime Commission built vessels in the Government yards operated by the Kaiser interests.

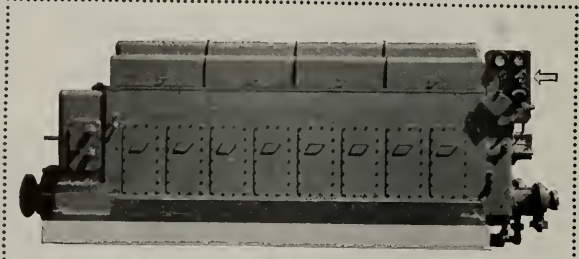
Old timers on the Pacific Coast will be glad to know that Commander **Denis A. Moloney,** at one time attached to the staff of the old Pacific Mail Steamship Company, member of the USNR (retired) and now president of the Newtex Steamship Corp., has been decorated with the Naval Reserve Medal for his service since 1939 until 1944 as assistant to Commodore John Reinicke, Port Director, New York Harbor.

Joseph A. Lunny, vice president of the McCormick Steamship Company, is recuperating at his home following a severe illness that kept him under a doctor's care during most of the time he spent in Washington last February.

Joseph A. Moore, Jr., president of the Moore Drydock Company and head of the Propeller Club Port of San Francisco, is chairman of the annual Maritime Day celebration to be held in San Francisco, May 22. A program of aquatic events, ship inspection, luncheon and a dinner dansant have been tentatively decided by the committee.

Appointment

John V. Brach has been appointed Marine sales manager of Mackay Radio and Telegraph Corporation, Inc., an affiliate of International Telephone and Telegraph Corporation, it was recently announced. Mr. Brach, who has been in the communications business since 1927, has been with the I. T. & T. System for the past sixteen years.



Buckeye Marine Diesels equipped with

Alnor Exhaust Pyrometers

The Buckeye Machine Company, engine builders since 1908, use Alnor Exhaust Pyrometers for dependable temperature indication, in company with the majority of Diesel engine manufacturers. Checking exhaust temperatures with the Alnor Pyrometer is a dependable guide to uniform loading, efficient operation, and accurate adjustment and maintenance.

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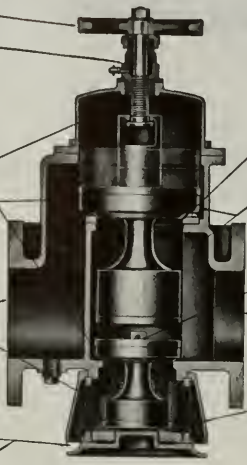
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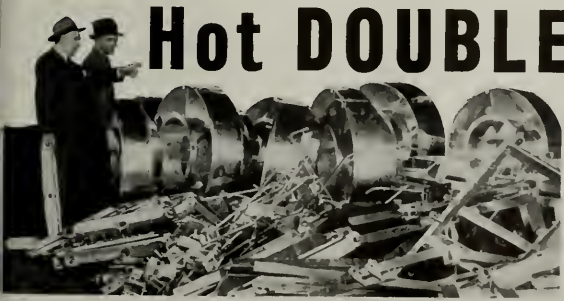
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Shoreside Personalities

Appointments and Detachments

The following appointments and detachments were recently made: **Leslie P. Ford,** chief engineer SS Honduras Victory; **Louis Dzuiba,** first assistant engineer SS Santa Catalina; **Alfred W. Joice,** first assistant engineer new motorship Maiden Eye; **Howard Talmadge Scott,** chief engineer same ship; **Captain Axel Nicholson** left the SS Thomas Nelson as master on February 22; he was succeeded by **Captain W. F. Cayle; J. A. Yanieses** has been named first assistant engineer of the SS Charles F. Amidon; **Carl M. Thorsen** is new chief engineer of the SS Santa Ana; **Captain M. Voge** is expected to be master of the SS Santa Isabel on her first trip in April; **Howard Vaughn** is the chief officer on the SS Santa Inez; **Leonard Bridges** left the SS Charles F. Amidon and his place was taken by **John Churchill.**



Franklin R. Hoadley, president of Farrel-Birmingham Company, Inc.

Interesting Merger

Farrel-Birmingham Company, Inc., manufacturer of heavy industrial machinery and equipment, has announced the purchase of The Atwood Machine Company of Stonington, Connecticut, pioneer manufacturer of textile machinery.

Franklin R. Hoadley, president and treasurer of The Atwood Machine Co. for the past eight years, succeeds **John W. Haddock** as president of Farrel-Birmingham. Farrel-Birmingham will build Atwood textile machinery at the Stonington plant, and will maintain the Atwood's 93-year old organization. **W. M. Fraser,** vice president, has been made general manager of the Atwood plant.

A group of his marine friends honored **Eugene (Gene) Hoffman,** popular public relations director for the American President Lines, and secretary-treasurer for the Propeller Club Port of San Francisco, on his 47th birthday with a surprise luncheon at the Hotel St. Francis on March 10.

Carroll Reeves, of De Laval Steam Turbine Company, was chairman of the arrangements. Among those present were Capt. Andrew Townsend of Matson; Edward H. Harms and Ray Burley of McCormick Steamship Co.; Eddie Martin of Westinghouse; L. M. "Dad" Le-Count of General Electric; John Davidson of American-Hawaiian; Byron Picard of Waterfront Employers Association; H. L. "Dutch" Pearson; and Capt. Henry Blackstone.



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Write for Bulletin 18 which describes Kinney Pumps in detail.

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Shoreside Activities

The Women's Organization for the American Merchant Marine, Port of San Francisco, held forth at the Army-Navy Club, in San Francisco, on March 13. Guest of the day was Rear Admiral Philip Roach, USCG (Retired), Coast Guard officer for 41 years and district CG officer for the 12th ND since April 12, 1942. He was retired on March 1 with the rank of Rear Admiral.

During his informal talk to the group he congratulated them on the splendid work being accomplished at the Davy Jones Locker, the Merchant Marine Canteen at 1000 Geary Street.

Another guest at the meeting was Captain Paul Cronk. He spoke of the contribution women can make, through their clubs and organizations and personal influence, toward helping to improve the living and working conditions aboard ship and in organizing social activities ashore for the men of the Merchant Marine.

Port of Los Angeles-Long Beach met in the Marine Room of the Hilton Hotel, Long Beach, on March 21 to hear Colonel William H. Evans, chairman of the Los Angeles County World's Fair Commission, address the assemblage in detail of the elaborate plans which are shaping up for a great World's Fair to be held in Los Angeles County (sometime around 1950). It was definitely a "Long Beach Civic Day."

From reports of Southern California Propellers, the proposed new student Port of the University of Southern California is shaping up and great things are expected now that the new semester is under way. The main pilot behind the student port activity is Alvin Allyn.

Appointment

Parker M. Robinson was appointed Vice President of the Harry W. Parsons Company effective March 10. He is in charge of the engineering and sales departments.



Highlight of recent nautical functions in the San Francisco Bay area was the formal dance at the U. S. Merchant Marine Cadet School, San Mateo, at which the Student Propeller Club of the school played host to the senior Propeller Club of San Francisco. Pictured at the dance on February 10th are Mr. and Mrs. Harry Parsons (center). He was former president of the Propeller Club of the United States. Commander and Mrs. A. O. Brady, USNR. He is commanding officer of the U. S. Merchant Marine Cadet School.

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L. O. Arringdale of the J. S. Coffin, Jr. Co., of Englewood, New Jersey, manufacturers of turbine driven boiler feed pumps, is on a visit to the Pacific coast in connection with the machinery trials of the first of the eleven Coast Guard cutters now being built at the Western Pipe and Steel Company's San Pedro yard. He is also coordinating the company's activities with the Coast distributors, the Harry W. Parsons Co. of San Francisco and the J. M. Costello Supply Co. of Wilmington, California.



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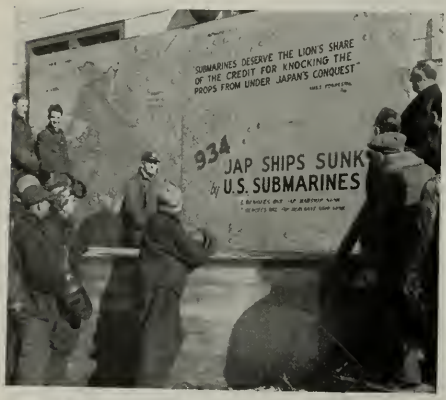
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As a fellow worker changes the total of Jap ships sunk by U. S. submarines from 934 to 958 on the huge map of the Pacific pasted at the main gates of the Electric Boat Company, nation's largest sub builders, the men and women who built them pause long enough to cheer the new record. The quotation on the map is by James Forrestal, Secretary of the Navy.

Ed. Note — (The sub score is now over 1000.)

Todd Record at San Pedro

During the year 1944 the Todd Shipyards Corporation, San Pedro plant, built, repaired, or converted 861 vessels, aggregating approximately six million tons.

The vessels handled at San Pedro included 320 cargo ships, 200 tankers, 100 transports and 60 Army vessels, as well as LST's, LSM's, LCI's, and other landing craft. There were also repair ships, destroyer escorts, frigates, training ships, supply ships, seaplane tenders, minesweepers, and other auxiliary Navy craft.

Among the vessels converted or built at San Pedro were two Navy repair ships, one specially designed vessel used for the repair of propulsion machinery of ships at sea, and one hospital ship. Four other ships were launched, including two seaplane tenders and two destroyer tenders.

One vessel put back in service was the U.S.S. Oglala, which was converted to a repair ship at Todd-San Pedro. Formerly a minelayer, the vessel was capsized at Pearl Harbor and put out of commission during the December 7 raid. She was raised and arrived at Los Angeles Harbor under her own power. She entered the Todd-San Pedro yard where a complete conversion job was accomplished.

The Todd yard also outfitted and put in commission the U.S.S. Mercy, modern 700-bed hospital ship, which is now shuttling back and forth between South Pacific battlefronts, taking care of wounded men and transporting them to base hospitals. The ship was completed from a C1 cargo hull.

Willard Gets 3rd "E"

Under Secretary of War, **Robert P. Patterson,** announces that Willard Storage Battery Company has just won for the third time the Army-Navy "E" Award for achievement in the production of war materiel at the company's Cleveland plant.

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OBITS

Frank Tuttle, for more than 25 years assistant chief wharfinger in San Francisco, passed away at the age of 82, in a Berkeley hospital, after a short illness. Mr. Tuttle retired his wharfinger post seven years ago.

Lieutenant Commander George F. Morin, commanding officer of Sandy Hook Lifeboat Station, who gained nationwide acclaim as director of rescue operations at the Morro Castle disaster, died in New York following an operation for a stomach disorder.



HARBOR BOAT BUILDING CO. is now booking orders for this new postwar design ready for immediate production as soon as war restrictions are lifted. A roomy and luxurious craft which embodies our full wartime experience and combines trim lines with stamina and endurance. Orders are now being received on a basis whereby economies of production will be returned to the purchaser as they are effected through volume construction. Inquiries invited — deliveries made in order of receipt of contracts.

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Stuart Rose Joins Harry W. Parsons, Inc.

Stuart Rose, who was purchasing agent for Western Pipe and Steel for about eight years, has recently joined the staff of Harry W. Parsons, Inc., Engineers, of San Francisco and Los Angeles. His duties will be coordinating the sales and production departments of the company.

Rose graduated from the University of California engineering school in 1934, and for the past two years had been flying with the U. S. Army Air Corps, retiring as a first lieutenant.

Vice Admiral Emory S. Land, WSA, who is chairman of the Washington Branch of the United States Marine Executive Board, announces assignment of the following well-known Government shipping officials to represent the WSA in connection with the board's activities:

Capt. Granville Conway, deputy administrator, WSA vessel utilization and planning, appointed to the shipping employment policy committee; Dudley Donald, director, division of allocations of WSA, appointed to the allocations (dry cargo) committee; F. M. Barr, director, division of traffic, appointed to the traffic control committee; John Winterbottom, director, division of tanker allocations within WSA, appointed to the tanker allocations committee; John F. McArt, director of the WSA division of freight rates and surcharges, appointed to the committee on tramp, liner and tanker rates; and John W. Mann, WSA director of the division of foreign charters and ship warrants, appointed to the committee on shipping facilities control.

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Bethlehem-Alameda Awards

The Distinguished Service to Safety Award of the National Safety Council was presented to Bethlehem-Alameda Shipyard, Inc., by Earl F. Campbell, Director of the Western Region, on February 14, and received on behalf of the Company by E. F. Lange, safety engineer of the yard. Mr. Campbell pointed out that for the first ten months of 1944, the accident severity rate was reduced 69 per cent and the frequency rate 46 per cent. He further stated that in the last three years, four safety awards have been made by the National Safety Council in the 11 Western states, with three of them going to Bethlehem Shipyards. The Bethlehem-Alameda yard enjoys the further distinction of having had the lowest accident frequency rate and lowest accident severity rate, during 1944, among all of Bethlehem's 15 shipyards.



Bethlehem - Alameda awarded Security Shield of Honor by United States Coast Guard. Picture shows Captain W. K. Scammell, 12 ND Coast Guard Officer (center) with group of interested yard employees and East Bay Safety Council men, during the awarding ceremony.



SIMPSON STEEL CO. RECEIVES MARITIME "M" AWARD

Official ceremony and presentation of pennant and Victory fleet flag at Simpson Steel Plant at Los Angeles. At the mike is R. N. Simpson, president about to receive the pennant from R. W. Owen, Public Relations, U. S. Maritime Commission.

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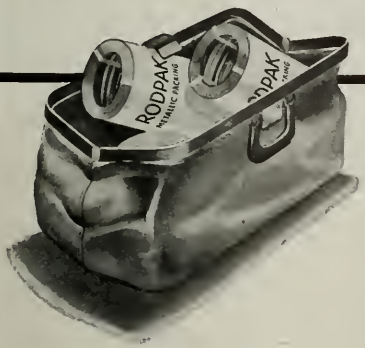
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SEAMAN RECEIVES SEATTLE ART PRIZE

Linwood Clark Borum, 2nd officer, received a $50.00 War Bond recently, donated by the Propeller Club of Seattle, as a prize for his painting "Storm on the Coast." The painting was shown at Seattle last fall as part of the 1944 Art Exhibition for Merchant Seamen of the United Nations.

NECROLOGY

De Laval Steam Turbine Company of Trenton, New Jersey, announced with deep sorrow the passing of Ralph Stoddard, chairman of the Board of Directors and Treasurer on February 20.

Alexander Greig Passes

Alexander Greig, well known in steamship circles, passed away March 1 at his home in Oakland.

Mr. Greig had been retired since 1939 and was 67 years of age. He was a native of Scotland and came to San Francisco in 1881. He served as dockmaster in the Philippines and later as superintendent of docking and repair of vessels in the Panama Canal. He served as surveyor of the American Bureau of Shipping during World War I and continued in maritime activities until his retirement.

Walter Schwenk Dies in New York

Death came to Walter W. Schwenk, 44, Atlantic Coast director of the War Shipping Administration, at Doctors Hospital, New York, March 15, following an operation performed in February.

Mr. Schwenk's position with the WSA was reported to be one of the most important shipping posts in the country. He was directly responsible for the dispatching of cargo and the movement of vessels on the entire Atlantic Coast. He joined the U. S. Maritime Commission in 1940 and became associated with the WSA when that agency was established in February, 1942, and took over the national functions of the commission with the exception of shipbuilding.

Mr. Schwenk is survived by his wife, Margaret, and two children.

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Lt. Comdr. Bryant

Lieutenant Commander Stewart F. Bryant, USN, retired, passed way after a brief illness at Stanford Hospital, San Francisco.

Commander Bryant, before his retirement in 1930, served in naval intelligence in the Far East. He was a member of the International Military Police of Vladivostok and accompanied President Harding's mission to the Philippines.

After receiving his commission at Annapolis in 1913, he served at the American Embassy in Constantinople. In 1917 he was attached to the office of naval intelligence and in the following year became executive officer and commander of the USS Mayflower under President Wilson. In succeeding years he was staff intelligence officer to the commander-in-chief of the Asiatic Fleet, member of the mission to the Philippines under General Leonard Wood, secretary of the War Plans Division of the Navy Department, Fleet Communication Officer of the U. S. Battle Fleet, and secretary to the commandant of the 12th ND in San Francisco.

Following his retirement in 1930 he undertook research in political science at Stanford University and became West Coast director of the League of Nations Association. Since 1933 he had lectured and written on international affairs.

Interests closest to his heart were the Navy, American-Soviet relations, national security, and world peace. Because of his deep desire for world peace, he labored to increase knowledge and understanding of Russia, and friendship between his own nation and the Soviet Union.

He is survived by his wife, Valeda Bryant, and four children.

Condolences Extended

Condolences were extended **Captain H. F. Strother,** secretary of the Masters, Mates & Pilots Association, over the death of Mrs. Strother, who passed away in February. Mrs. Strother was the organizer and first president of the Women's Auxiliary of the Masters, Mates and Pilots Association. In addition to her husband she is survived by her son, Charles.



Capt. Gerald M. Sieben (right) soon to be released from active duty in the Army is the newly appointed Veterans' Counsellor at the San Francisco shipyard of Bethlehem Steel Company. Alfred M. Palacios, a native San Franciscan, and wearer of a Presidential Unit Citation and the Purple Heart, is being interviewed while seeking employment at the yard.

IN MEMORY OF
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Ships and men, ships and men,
For you and me, he taught us when
We knew so little and the war was young—
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We learned the ways that ships must be
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We learned the ways of men in life,
Who often feel such inner strife;
But he who shared of his rich store
Still lives in us, and through our door
His ship still plys the open sea
Exemplified in you and me.

Acquires Interest

Ralph Montali, owner and general mgr. of the Anchor Marine Supply and Manufacturing Company, now engaged solely in war contracts, has acquired a substantial interest in the Juillard-Cockcroft Corporation, pioneer wholesale grocers and liquor importers.



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Bishop Appointed To Succeed Schwenk

Captain Hewlett R. Bishop has been appointed Acting Atlantic Coast Director of the War Shipping Administration to succeed the late Walter W. Schwenk.

Captain Bishop is married, has a 3-year-old son and resides at Freeport, Long Island. He began his steamship career in 1923 and has come up through the ranks from seaman to master. From 1928 to 1941 he was employed by the United States Shipping Board, the United States Maritime Commission and the Roosevelt Steamship Company (U. S. Lines) as executive officer on such vessels as the Washington, Manhattan and America.

Since July, 1941, Captain Bishop has been senior port captain and manager of cargo operations for the Atlantic Coast District of the Maritime Commission and the War Shipping Administration.

Terminal Rate Plan Discussed At Port Meet

California Port authorities met in San Francisco during December on call of President A. M. Rosenfeld of Los Angeles to consider matters in connection with the recently initiated U. S. Maritime Commission Docket 640 Terminal Rate Structure—California Ports.



A. M. Rosenfeld, president, California Association of Port Authorities.

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MAY, 1945



Army Air Forces Photo

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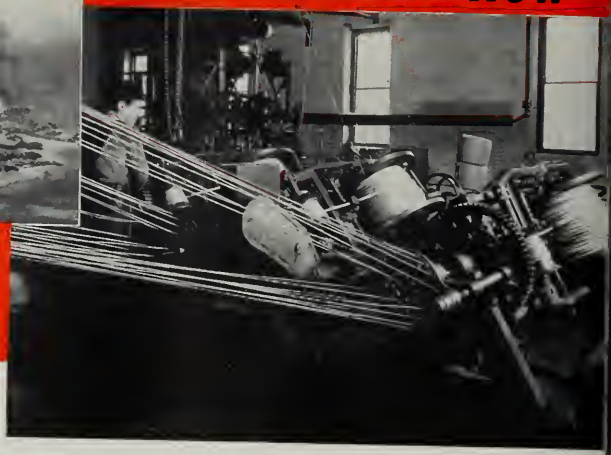
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Subscription rates:
One year, $1.50; two years, $2.50; three years, $3.00; foreign, $1.00 additional per year; single copies, 25c.

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PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
Offices In: NEW YORK CITY . . . . . 16 West 46th Street, Telephone BRyant 9-8436
LOS ANGELES . . . . . 816 West 5th Street, 13, Telephone Michigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.



Running Lights for Progress

In the blackness that is war, a few lights burn brightly.

Research, for example, spotlights the unknown. During war it is intensified... its job accelerated.

In this way, paradoxically, war helps humanity.

Better ways of doing things... new applications for old materials... improved materials for standard requirements... new materials to solve new problems... these are only a few of the ways in which the laboratories serve.

They serve... always... providing light to probe the darkness of the unknown.

* * *

Some day soon peace will open the tradeways of the world again.

When that day comes, one job we will face is that of converting our wartime shipping to carriers for the commerce of peace.

Flintkote's wartime experience... in munitions and cargo protection, special deck coverings and in solving other problems of a confidential nature... will be a big help on that job.

The new techniques and materials that Flintkote has developed will simplify, speed and improve your part of this conversion.

Our research staff... backed by almost 50 years of experience in meeting industry's needs... will welcome the opportunity to work with you on your problems.

FLINTKOTE MARINE PRODUCTS

Flintdek Fire-Retardent Deckings • Flintmot Non-Slip Deck Coverings • Heavy Duty Mastic Coverings • Marine Adhesives • Marine Bituminous Enamel • Marine Insulation Cements • Marine Protective Coatings • Permakote Deck Coverings • Permaset Deck Coverings

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It's Our Merchant Marine! What Are We Going To Do With It?

Pacific MARINE REVIEW

We, the people of the United States, now own the largest fleet of merchant vessels ever assembled under one ownership.

The great majority of the ships composing this fleet are ordinary cargo carriers of the standard EC-2 (Liberty) type.

This vessel planned for war service has performed that service with great faithfulness and with an efficiency that has surprised shipbuilders and ship operators. However, these vessels are not the type for commercial operation in the post-war world. Their usefulness there would be only as "tramp" cargo carriers.

There will be a limited but active demand for such vessels immediately after the war from "tramp" ship operators. During this immediate post-war period freights will be high and the "tramp" operators will be willing to pay good prices for vessels ready to operate. This market opportunity to sell Liberty ships will last not longer than six months to a year after the war is over.

The Liberty ship is not the type of structure that can be laid up for 15 or 20 years and then be fit for cargo carrying in another war. Therefore they should be written off as a war liability.

Standard long-range types of the Maritime Commission C1, C2, C3, C4, and the Victory types are fit for commercial competition and should be sold on equitable terms to American ship operators for use on the various off-shore and coastwise runs. Maritime Commission has the requisite legal directives and administrative machinery to take care of this problem. When we consider the number of these vessels converted for Army and Navy special uses we see that those left can be absorbed by America's normal water-borne trade.

Tankers in great numbers have been built, and these are a special problem which must be solved jointly by the Maritime Commission, the Navy, and the tankship operators.

The special problem facing the American people as shipowners is: What will we do with some 2800 "Liberty" ships—war babies—for which we have no commercial use?

Roughly these steamers represent, on a purely commercial basis, 7,000,000 tons of scrap steel plus a huge pile of salvageable cast iron, small steam engine generating sets, steam boilers, steam drive pumps, steam drive cargo winches, windlasses, condenser tubing, machine tools, pipe, ventilating fans and many other items.

Shall we lay them up as an immobilized fleet to be ready for an emergency?

We did that after the last war, and found that it was no solution, but a decided handicap to solving our merchant marine problem.

Shall we sell all we can and scrap those we can't sell?

This disposal seems to the writer the only sensible solution of the problem. A large number of idle ships scares private capital away from investment in shipping. This fosters Government operation. Government gets tired of paying the bills and throws ships on the market. Ship prices drop and shipowners buy in at prices approximating "10 cents on the dollar." This quoted figure is the popular conception of the way ships were sold after the last war. However, it was not until three and a half years after the Armistice that ships could be bought so cheaply, and those three and a half years completed then the cycle of lay-ups, Government operation, Government disgust, Government sales.

Let's not repeat this time the mistake we made last time.

Let's sell all the EC-2 "Libertys" we can and scrap the rest.

Let's immobilize under care of the Navy and the Army the large fleets of merchant vessels converted to special war uses under their direction.

Let's build on the foundation of our fleet of good merchant vessels a modern merchant marine to serve American commerce.



The USS Kearsarge as she looked in 1904 when she was one of the fighting battlewagons of the U. S. Fleet. *(Official U. S. Navy photograph)*

AB1 ship crane at U. S. Naval Drydocks, Hunters Point, San Francisco. Note name Kearsarge on stern. *(Official U. S. Navy photograph)*



The

For Old-Timers

The interior pictures with which this article is illustrated depict the machinery of the U. S. Battleship Kearsarge (now a U. S. Navy floating crane) as it is today and substantially as it was when installed at Newport News in 1897-98. This machinery is therefore 48 years old.

Some of our readers will have nostalgic memories of their apprenticeship days when they helped install similar machinery in war and merchant ships. Younger engineers and shipbuilders may be interested in comparing 150-psi reciprocating steam engines and 80-volt motors with the more compact and more streamlined mechanisms of our present phase in marine machinery design.

The machinery shown is typical of the installations that were being made in the principal shipyards of the United States during the Nineties of last century. These yards were Cramps and Newport News on the Atlantic Coast and the Union Iron Works on the Pacific Coast. Coal-burning cylindrical boilers, triple-expansion steam engines for the propulsion power. Single or compound steam engine drive for generating sets, pumps and forced draft blowers. Electric drive for ammunition hoist, ventilating, turret turning, and deck machinery operations.

USS KEARSARGE, Dowager Queen of the U. S. Fleet, is the oldest American battleship still in commission, and she continues to perform an important service for those of her brood that come in from overseas needing overhaul or repair. Of course her name is changed—she's now the AB1 crane ship at the U. S.

Oldest Commissioned Battleship in U. S. Navy

By G. A. BRADFORD

Naval Drydocks, Hunters Point—but the proud old name Kearsarge is clearly legible across her stern.

Unlike every other U. S. battleship, she was not named for a state, but was christened after the famous wooden steam frigate that met and sank the Alabama off Cherbourg, France, in June of 1864. She and her sister ship, the Kentucky, slid down the ways at Newport News, Va., in a dual launching that attracted nationwide publicity. The story goes that several Kentucky colonels were highly incensed at the thought of the proud USS Kentucky being christened with a bottle of plain water — even though it was taken from the well at Abe Lincoln's birthplace. Consequently the air that day was filled with the aroma of the best of Kentucky bourbon as they supplemented the ceremonies by throwing their own private stock at the hull as she went into the water.

Commissioned in 1900, this 11,250-ton ship was 368 feet long, with a beam of 72 feet 2½ inches and a mean draft of 23 feet 6 inches. She carried four 13-inch guns, four 8-inchers and 14 5-inchers. Her engines produced 11,500 ihp, which drove the hull at a speed of 16½ knots.

She and her sister ship, the Kentucky, caused quite a stir in naval circles at the turn of the century because they were the first American battleships to use the double decked turret. Advantages and disadvantages were hurled back and forth between designers and Navy big-wigs, some saying the additional protection afforded the 8" ammunition hoist more than compensated for the possibility of an enemy knocking out, by one lucky shot, half of the armor-piercing fire power of the entire ship. Others complained that so much weight at the extremities of the ship would make her very difficult to handle in heavy weather. True it is that with low freeboard and ramming prow she shipped plenty of water when the going got rough.

It was in 1922 that she was converted into a 250-ton crane ship. Her decks were virtually stripped so that little of the original fighting ship remains, but below decks that's another story. Evidences of her equipment and operation are still manifest throughout the hull. The old leather

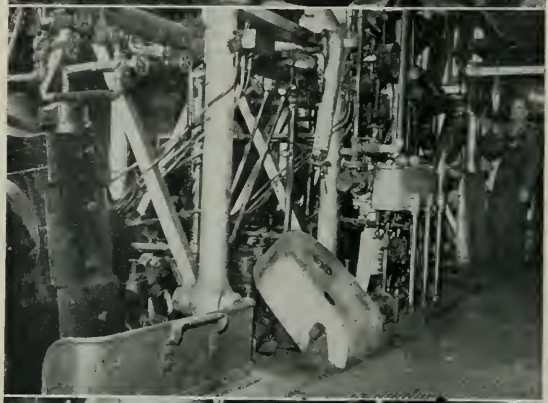


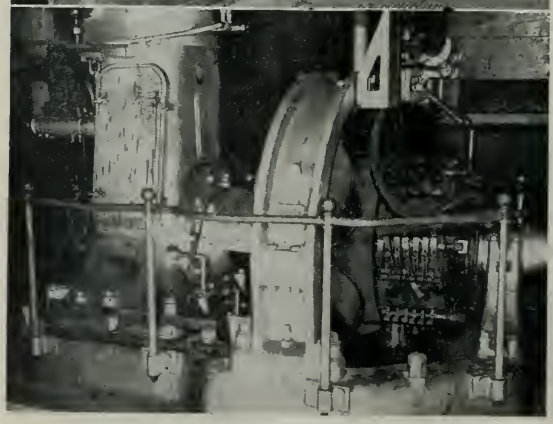
Right: A view of the crane aboard the AB1.
(Official U. S. Navy photograph)

Below: The heavy tread of two generations of Navy personnel has worn through these steel steps.









covered lounges are still in use in the Admiral's quarters in the after part of the ship. Also still in use and still running are some of the old General Electric motors installed on the vessel almost 50 years ago.

Electrically the USS Kearsarge was important too. In 1899 the Society of Naval Architects and Marine Engineers reported: "The Kentucky and the Kearsarge are the first vessels of the U. S. Navy on which the use of electricity as motive power for the ship's auxiliaries has been adopted to the practical exclusion of steam." These auxiliaries included all those used for general service in deck winches, boat cranes, ship's ventilating fans, ammunition hoists and turret turning machinery. About this time S. Dana Greene presented a paper before the American Institute of Electrical Engineers discussing the merits of electricity as a source of power aboard ships. His discussion interests us in that although the contrasting efficiency of electricity and steam was "very striking in favor of electricity," the greatest emphasis was placed on advantages relative to the comfort and safety of the men. The electrical distribution was on the Edison three-wire system at 80 and 160 volts direct current. Seven General Electric single cylinder steam engines using steam at 100 lbs. pressure drove the multi-polar type generators at 310 rpm, developing an output of 50 kw.

Power was transmitted through conduit in the engine rooms, fire rooms, magazines, and to deck machinery. Lighting circuits were carried in wooden molding. The mammoth gun turrets were each directed by two 50-hp motors, while the deck winches used some of the very first totally enclosed armored 25-hp General Electric motors developed for marine use. These motors are still in use today, as are the 12-hp, 500-rpm motors that drive the ventilating fans. Other electric motors were used in the ammunition hoists (20-hp, 350-rpm for the 13", 6-hp for the 8"

Top of page: A 25-hp, 160-volt motor drives these winches, which are still used for warping the ship.

Center: One of the two 3-cylinder triple expansion main propulsion engines.

Bottom: One of the seven 80-160-volt, 50-kw, D.C. generating sets.

guns), in the exhaust fans (3-hp, 1030-rpm), in the two boat cranes (50-hp, 400-rpm).

Have you ever had the feeling that you'd like to go back about half a century? If so, you'd enjoy standing on the deck of the ABI, watching her gigantic 250-ton marine crane in smooth operation. Then, in less time than it takes to tell it, step below and find yourself in the midst of equipment and designs that echo the problems of 50 years ago. The old locker rooms, coal-burning furnaces, coal bunkers and chutes, ash hoists, the old Allen dense air refrigerating machine that was "capable of producing the cooling effect of one ton of ice per day," the steam steering engine that was "capable of pulling the rudder from hard over to hard over in 20 seconds with ship at full speed." The propulsion equipment comprises two three-cylinder triple expansion reciprocating engines (still turned over once a week to keep them free and lubricated). Scratch the main steam pipe and you find it is solid copper reinforced by occasional steel bands. Climb the steel stairs that are worn completely through with the tread of Navy feet headed for chow or the sack.

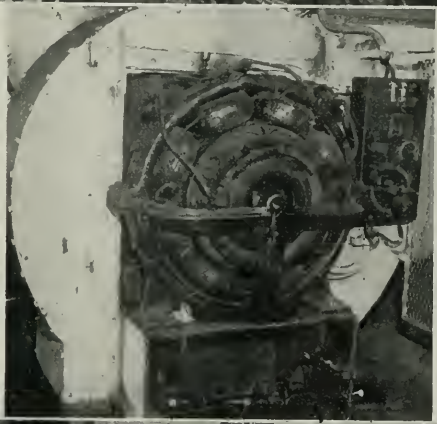
The engineering complement required for her trial run was:

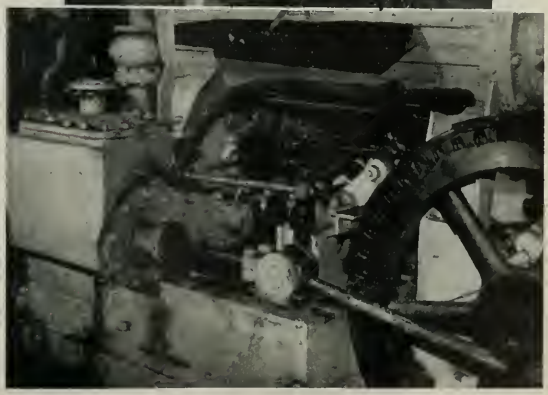
7 engineers	3 pumpers
6 water tenders	3 storekeepers
10 machinists	29 firemen
24 oilers	29 coal heavers
6 apprentices	3 ice machine men
3 dynamo oilers	5 boiler makers

A total of 128 men.

Back on deck with the crane overhead, she's still in superlative classification as the largest marine floating crane on the West Coast. But she commands greatest respect as the hull of the proud USS Kearsarge—the veteran of other wars, doing her part in this one.







Top of page: This Williamson Bros. combined hand and steam steering machine permits six or more men to handle steering in heavy weather if the steam machine becomes inoperative.

Center: One of the original ten, this 12-hp, 500-rpm, 160-volt ventilating fan motor now operating from a 220-volt bus bar leads a useful life.

Bottom: A well-used Allen dense air refrigerating machine, dear (?) to the heart of old-time marine engineers.

Future For Pacific Coast Shipbuilding and Ship Repair



C. W. Flesher

By C. W. Flesher

WE ARE ALL aware at this time that accelerated shipbuilding as a war necessity is coming to a close. All shipbuilding contracts for new construction will be completed by December 31, 1945. During this accelerated program, we reached a peak employment of approximately 300,000 shipyard workers on the West Coast. Employment at the present time has dropped to approximately 200,000, with 85,000 in the Bay Area. By July, employment in our shipyards will be approximately 125,000, with 40,000 in the Bay Area. This "de-acceleration" in new ship construction, however, has been carefully planned for by the Maritime Commission, so that it may be brought about gradually and with the least disturbance to both management and labor. Workers at the present time are permitted to be officially transferred into other vital war work and essential industries, and likewise both large and small manufacturing establishments are being permitted to gradually convert back into their normal peacetime manufacturing pursuits.

We will end the war with approximately 5500 ships, a fleet five times as large as our pre-war merchant marine—larger, in fact, than all the pre-war fleets of Great Britain, the United States, Norway and Germany combined. It is more than one fleet, however; it is really two fleets. One is the inefficient fleet, consisting of 7½ million tons of over-aged vessels and 26 million tons of Libertys, all of which are second choice ships during peacetime operation. And the other is the efficient fleet, which will consist of 2200 ships, or 24 million tons, of fast Victorys, tankers and "C" type vessels, which are modern, economical to operate, and which constitute the finest ships of their type in the world.

Disposition of Tonnage

The disposition of this tonnage after the war is, of course, a national problem. This tremendous fleet was built by American ingenuity and resources, paid for with American taxes and owned by America. It needs the earnest attention and consideration of each and every one of us so that its future will be protected. The disposition of this tonnage will most surely affect everyone in the United States either directly or indirectly. Our responsibilities of foreign trade, our national defense and our national well-being will require a larger operating merchant fleet than existed prior to the war—a greater number of naval establishments, and a substantial reserve and laid-up fleet. We have always been a maritime nation. In the days of the Clipper ships, we rendered world-wide service and developed trade which made a great contribution to the upbuilding of our then young nation. For years we have appeared to forget that experience. It is time we remembered.

To be realistic, we can say that it has taken the lessons of two world wars to teach us that the maintenance of an adequate merchant fleet is a vital national need. In war, our national security depends upon this fleet to immediately transport men and materials in every emergency. In peace to come, it will be a most important factor in the economic prosperity of the nation and in the expansion of American trade for the reconstruction of a war-torn world.

International Control

Proper control of the Axis merchant marine operations appears to be just as necessary to maintenance of future peace as is their disarming and prevention of their rearming. Those powers should not be quarantined, for they must survive. They must be allowed to engage in trade, but at the same time they must not be permitted to expand aggressively. Before this war, the Axis ships carried the bulk of Axis foreign commerce. The proportions were Japan, 70%; Germany, 58%; and Italy, 46%. They made it virtually impossible for any other nation to participate in the transportation of this trade. Their steamship lines were managed so that they could exercise the greatest competitive pressure on other maritime nations, and vessels were especially designed to seize a share of our water-borne commerce. And they succeeded, for 1938 figures show that the Axis merchant marine carried close to 12% of the U. S. foreign commerce, and ships flying the American flag, the country which produced this volume of business, carried only 25%. In some years since 1900 our ships have carried as little as 8% and seldom have exceeded the 30% mark. I believe we have not scratched the surface of our foreign trade potential. We have been able to get together on the limi-

(The author is head of the West Coast Regional Construction Office, U. S. Maritime Commission.)

tation of armies and navies and aircraft—why can't we do the same thing with merchant ships? We, the American people, should insist upon a reasonable representation in the world routes of trade.

Long-Range Program

The Maritime Commission is interested in a permanent, long-range merchant marine program, but it will not develop from our emergency operations. It is something that will require considerable thought, logic and action for the next 20 to 30 years. Success in shipping, as elsewhere, calls for energy, vision and hard work. There can be no substitute. Public support alone cannot save an industry. Therefore, operators representing the industry must have the capacity to carry their load, and their organizations, both ashore and afloat, must function with efficiency and economy. We know we will have the ships and ample well-trained, experienced crews to operate them. Those are our war-created resources. It is up to the Government, the ship operators and the American people to determine how best to utilize those resources. With thorough cooperation the Maritime Commission expects to reestablish and maintain maritime greatness for our nation, for preparedness remains our only assurance of peace.

Both the Government and the public should live up to the intent of the Merchant Marine Act of 1936 and see to it that private enterprise, properly supported and protected, operates American flag shipping. However, it will be impossible to have a strong Navy and a vigorous and healthy merchant marine without an efficient shipbuilding and ship repairing industry. Consideration of the future of the shipbuildng and ship repairing industry therefore must necessarily take into account the demand for ships for trade and for national defense. We must maintain a substantial shipbuilding industry to which will be assigned the important duty of adding modern and efficient ships to our peacetime fleet. We must keep adding ships, fast, fine ships that will meet the best foreign competition. We must have repair yards to keep these ships in tiptop condition at all times. The care and preservation of the vast number of naval and Government vessels built during the war and which certainly cannot be accommodated by Government Navy yards could very well be carried on by private shipbuilding and ship repairing industries. There has always been a need for a well-planned shipbuilding program throughout the world to replace obsolete tonnage. Prior to the forming of the Maritime Commission this tonnage was principally constructed in England, Scotland, Norway, Holland, Sweden, Germany and Japan. Almost half the population in Scotland alone depends on shipbuilding either directly or indirectly as a means of livelihood. Because of this, they have won a world-wide reputation as shipbuilders. Our nation leads in many types of manufactures, such as automobiles, railroads, airplanes, communications and highways—**why not shipbuilding?**

The People's Problem

There are many factors to be considered in studying the over-all problem of maintaining an adequate merchant marine after the war. The Navy looks to the merchant marine for trained officers and men. But how large a fleet do we need, and what about subsidies to operate them? American crews get higher wages—how much should the American public be taxed to overcome these higher operating costs, as compared to the lower costs of other maritime nations? Another important problem is how much world trade should be carried by ships flying the American flag. And what of our Allies who depend on maritime income far more than we do and whose pre-war fleets will be practically nil when the war ends? Shall we sell them ships from our efficient fleet? Shall we help them to recover from the war by setting them up in competition with us again on the seven seas, or shall we keep all our good ships and try to hold our mastery of the merchant seas?

If our ship operators do not want the inefficient ships and if we cannot sell them, or decide not to sell them, then what? Shall they be scrapped or be left to rust as a strategic reserve? These are only some of the problems confronting the Chairman and members of the Maritime Commission—the Government—and the American public.

Repair Yards

As our new ships become older, the need for replacement and repair increases. We must not fall behind in the game of competition with our foreign competitors—we must modernize our fleets. For this reason, yards formerly in new construction work are now entering into repair work. In the Oakland Bay Area we intend to retain our maritime facilities to assist with conversion, ship repair and any future new ship construction. In my opinion, there is no reason why peacetime shipbuilding should not be retained in this area on a permanent basis, if you really desire it. You have the ability in your yard management, you have the skilled labor in the area, and you have the facilities. I believe, therefore, you should plan for permanent shipbuilding in this area.

The repair work planned during the reconversion period will assist to a limited degree in the utilization of labor. However, we all know the present repair load will decrease gradually following the end of the war, as there will be no more battle damage, and ships will undoubtedly be gradually taken out of service and laid-up pending the solution to that over-all problem—disposition.

However, before this takes place, a sizable amount of work will be required in the gradual reconversion of ships in order that they may be outfitted for peacetime trade in particular trade routes. If post-war shipping from San Francisco is maintained at a level anticipated by many shipping men, reconversion and repair should represent a considerable amount of work for our Bay yards.

Post-war Pacific Trade

I agree with those who believe that our trade in the Pacific will flourish after the war. Japan's fleet will be almost completely destroyed, and reconstruction throughout the South Pacific and the Orient will undoubtedly require enormous quantities of every conceivable item. It is difficult to know at this time just how much equipment and materials will be required or for how long. It is only logical, however, to assume that these should be carried by American ships.

While wartime shipbuilding is coming to a close, I am confident that a new era is beginning. Shipbuilding, ship repair, and conversion for the post-war will far exceed that which has been accomplished at any other normal time in this area. And with the further industrialization of the West, which will undoubtedly take place, shipbuilding, in my opinion, is here to stay!



YP-617, first of this type placed in U. S. Navy service.

NAVAL REFRIGERATED CARGO VESSEL

THE FIRST of a new type of U. S. Navy refrigerated cargo vessel, designated the YP - 617, has recently been delivered by the Harbor Boat Building Company, Los Angeles, Calif. These vessels are especially designed for the delivery of perishable foods to the fighting men on the many small islands of the South Pacific. The design is similar in type to the well-known West Coast tuna clipper, and the vessels will easily be converted for tuna fishing after the war.

This design was produced by John Rados, president, Myles Rados, vice president, and J. D. Hamilton, general manager, of the Harbor Boat Building Company, under the supervision of the U. S. Navy. The Harbor Boat Building Company was chosen by the Navy as the lead yard

Another view of the YP-617.



in the production of these vessels, which are now under construction both at this yard and 14 other Pacific Coast boat building plants.

The hold of the YP-617 is built of wood, is 128 feet long, and has a 29-foot beam. More than a half-million feet of lumber is used in the construction of each hull.

Below the deck the cargo space is divided into ten refrigerated wells, six of which are of wood construction and four of steel. All of these wells are refrigerated with ammonia coils, and their combined capacity is over 250 tons of refrigerated cargo.

The refrigeration equipment consists of two 6½" x 6½" compressors manufactured by the Baker Ice Machine Co. of Los Angeles. Ammonia is used as a refrigerant and is distributed to the refrigeration chambers through Ammonoduct and special refrigeration piping manufactured by the Bethlehem Steel Co. The refrigerated cargo holds are designed to carry either liquid or dry stores, and the system is designed to operate on various selected temperatures so as to handle several different types of refrigerated cargo. Refrigeration capacity is 25 tons in 24 hours. Insulation and refrigeration machinery are capable of freezing the loaded hold to an average of 10° below zero. With the refrigeration system shut down the insulation will maintain a temperature below freezing for approximately 12 hours.

The propulsion machinery is a direct reversing 560-hp Union diesel engine, going through suitable gearing with 6" propeller shaft and driving a 77" propeller. An interesting feature is the use of Micarta stave type stern tube bearings on these propeller shafts. Electric power for lighting and auxiliary machinery is provided by two 120-kw Union diesel generating sets.

Among the auxiliaries are: electric steering units; a complete ventilating system throughout the ship to meet tropical conditions; an automatic heating system for accommodations; and an automatic hot and cold fresh water distributing system.

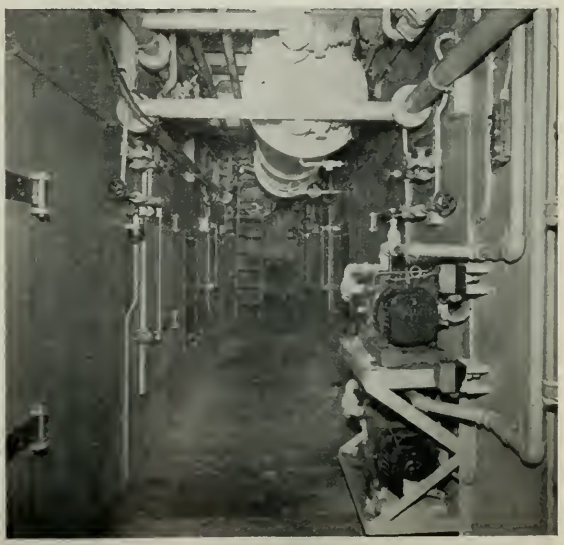
The bilge salt water pumping sys-

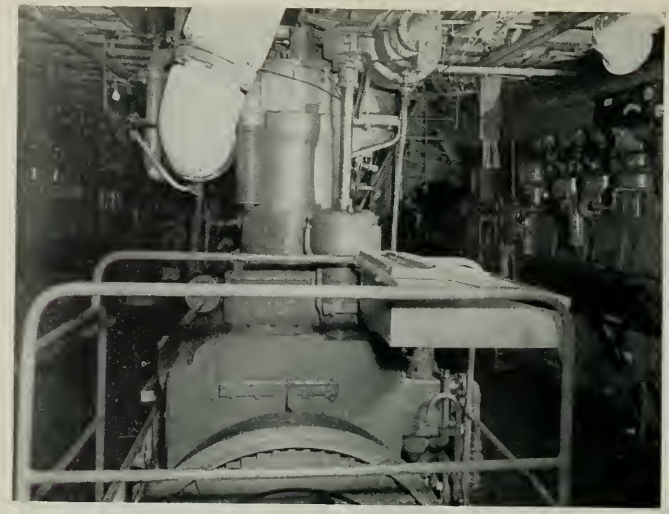


Upper machinery space, showing switchboard and heating unit. Also located in this area are refrigeration compressors and other machinery units.

●

Shaft alley, looking aft from engine room, showing piping condensers and watertight doors to each of the refrigerated spaces.



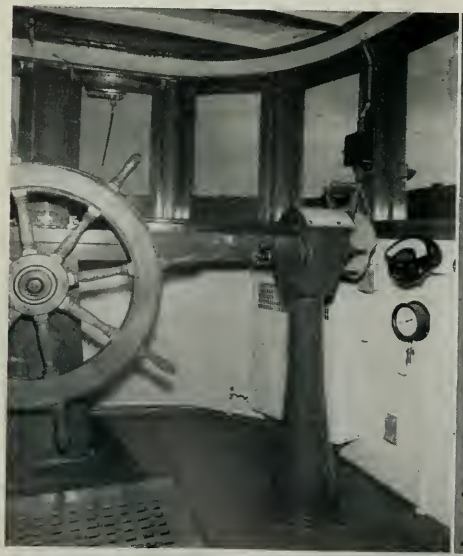


Engine room, showing main 560-hp Union diesel engine with 150-hp, 125-kw Union diesel generating sets on each wing.

tem has neatly designed discharge and suction manifolds so that suction may be taken either from the bilge or directly from the sea, and the discharge can be diverted either for condenser cooling in case of a break-down of the pumps of the refrigeration system or for fire fighting. For fire protection there is also a CO_2 system and a Foamite system.

Very comfortable accommodations are provided for three officers and 20 men. Our illustrations show the care in design and the neat workmanlike construction and installation features of these vessels.

Portion of pilot house, showing automatic steering and engine room controls.



One of the refrigerated cargo holds, showing coils and protective grating, and opening to main deck.



Coast Guard Approves Aluminum Lifeboat

After intensive tests by the Coast Guard, a new aluminum lifeboat has been approved for installation on American merchant ships. The new boat, weighing considerably less than a wooden one of the same cubic capacity, and approximately half that of a steel lifeboat of the same capacity, is resistant to the action of the various corrosive agents found at sea, and, because of its lighter weight, materially reduces the weight installed on upper decks, thereby favorably affecting the stability of the vessel.

Present regulations require that a lifeboat weighing over 5000 pounds with its equipment must be carried on gravity davits. The lighter boat, carrying the same equipment, would weigh less than 5000 pounds and could be handled with davits weighing much less than those required for a steel or wood lifeboat of the same capacity.

Aluminum lifeboats are not new, for the material was used experimentally for the purpose over ten years ago. One steamship company installed a number of aluminum lifeboats on a ship of its fleet in 1938, with satisfactory results.







Corrosion of Steels

In Sea Waters

By C. P. Larrabee

Study of experiments conducted by the corrosion committee of the British Iron and Steel Institute, together with other unpublished data, indicates that:

(1) The sulphur dioxide contaminated atmosphere at industrial locations, especially where the contamination was greatest, caused more corrosion than the sea salt deposited on the specimens at any marine site.

(2) At most locations where a succession of samples was exposed, considerable variation was found in the loss of weight during each of the five successive years.

Comparatively few data are available on the atmospheric corrosion of steels at purely marine sites. Buck reported in the Journal of Industrial & Engineering Chemistry, 1913, that the addition of small amounts of copper (0.01-2.0%) to both open hearth and Bessemer steels increased resistance to industrial atmospheric corrosion. Pilling and Wesley, reporting in the 1940 Proceedings of the American Society for Testing Materials, show that the addition of nickel lengthens the life of steel sheets in all atmospheres, and that it is especially beneficial in a marine atmosphere. Other work indicates that the presence of copper is more beneficial in industrial atmospheres than in certain marine atmospheres.

Kearny, N. J., where the United States Steel Corporation Research Laboratory is located, has more of an industrial atmosphere than marine, even though the site is within one-third mile of Newark Bay. Results of tests there are shown in the illustration. It is evident from these time-corrosion curves and an examination of the samples that the rusts which develop on different types of steel vary with the amount and character of alloy additions. These additions control the structure of the oxides which are more or less protective. Extensive work has demonstrated that each combination of alloying elements must be studied separately, and the law of diminishing returns plays an important part in determining the nature and amount of alloy additions which will be economical for a given purpose.

Increasing percentages of phosphorus in a 0.5 per cent copper open hearth steel increase the corrosion resistance in both industrial (Kearny, N. J.), and marine (Kure Beach, N. C.) atmospheres. The effect, however, is not as great in a marine as in an industrial atmosphere.

Various quantitative results prove that:

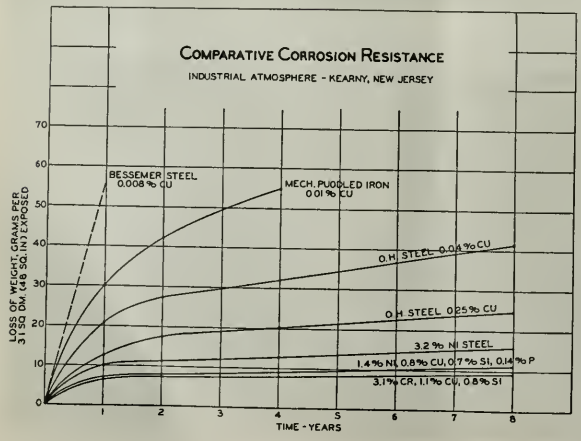
(1) The effect on atmospheric corrosion resistance of an alloy addition to steel is not necessarily the same in marine and industrial atmospheres.

(2) In any complete study of the corrosion resistance of low alloy steels, tests must be made of all compositions in both marine and industrial atmospheres.

The duration of total protection derived from the use of a zinc coating on steel depends upon the amount of coating and the atmospheric conditions. Near the ocean, and in the absence of sulphur dioxide, which is highly corrosive, a white coating appears on zinc, which under certain conditions is protective. There is also evidence that the intermediate iron-zinc layer is more resistant to salt than is zinc.

In rural and clean semi-industrial atmospheres, stainless steels remain untarnished for many years. After long exposure in severe industrial atmospheres, they become covered with a tarry soot, but any actual attack is of a very minor nature. Based on exposure tests near the water at Kure Beach, it appears that increasing the chromium content from 12 to 17 per cent increases corrosion resistance slightly. 18-8 chromium-nickel steel is attacked but slightly. The presence of 2 to 3 per cent molybdenum greatly improves the resistance of 18-8 steel to atmospheric

(The author is in the Research Laboratory of Carnegie - Illinois Steel Corporation. Text is a condensation of a paper presented before the April meeting of the Electrochemical Society, Atlantic City, N. J.)



corrosion, as it does when the steel is immersed in sea water, this steel (Type 316) being as resistant as even the 25-20 chromium nickel steel.

Summary-Marine Atmospheres

(1) Under the described test conditions and at any given location, the corrosion rate of an unprotected steel is dependent upon its composition.

(2) Low alloy, high-strength steels, with superior resistance in industrial atmospheres, are also more resistant in marine atmospheres, but to varying extents.

(3) The exact degree of superiority of an alloy steel over a plain steel with respect to resistance to corrosion at any place under specified conditions can be found only by actual tests, which should approximate expected service conditions as nearly as possible.

(4) To obtain untarnishable steel, a very high alloy content is necessary, with its attendant higher cost.

(5) Slight rusting usually mars the appearance of the lower grades of stainless steel in seacoast atmospheres, but in most cases the attack is only superficial and the strength is probably not significantly affected.

(6) Zinc-coated steel products are highly satisfactory under many conditions and are worthy of consideration in any proposed service.

Corrosion in Sea Water

Various tests show that:

(1) There are a number of factors involved in sea water corrosion.

(2) A test conducted as nearly as possible under the conditions of expected service will give the most useful results.

(3) The alloy steels tested were not consistently superior to plain steels.

(4) The average rate of attack on plain steels, 20 milligrams per square decimeter per day (0.0036 inch average per year) can be assumed with reasonable security under most conditions of immersion.

This average penetration agrees with tests conducted at Kure Beach, where clean sea water flows past the specimens at a rate of one to two feet per second. The results of a test there, to date, show that the corrosion rate for two experimental alloy steels is less than for a plain steel, and, moreover, is not linear. Results are in accord with La Que's statement (American Society for Metals, 1942) that chromium is the element most likely to confer resistance under submerged conditions. Molybdenum and titanium may play an important part in the superiority of the steels under test.

Considerable work is being done on the many types of stainless steels, but due to the fact that exposure in sea water is complicated by the presence of both vegetable and animal organisms, few definite recommendations can be made.

Tests at Kure Beach show that both 13 and 17 per cent chromium steels lose many times as much weight per day as 18-8 chromium-nickel steel or steels containing more of those two elements. Due to the presence of oxygen concentration cells set up by certain types of sea growths, about 3 per cent of molybdenum is essential in 18-8 steels to lessen the danger of excessive pitting. Stainless steels perform much better when in contact with sea water at velocities greater than 5 feet per second, and it has been noted that highly polished surfaces are somewhat more subject to pitting than when the surface is less highly finished. Stainless steel impellers have been found to be particularly satisfactory in pumps handling polluted harbor waters, especially when hydrogen sulphide is present.

Portland Tug Repowered

The 78-foot tug Hulda has seen many years and several types of service during her long career on the lower Columbia River.

Built in 1903 at Astoria, Oregon, she was used as a pilot vessel. She was later in service as a packet in touch with shipping along the Columbia River. About 1920, the original gasoline power plant was replaced by a diesel engine and the vessel was then commissioned as a towboat.

The necessity for a larger fleet of towboats by the Portland Tug and Barge Company of Portland, Oregon, resulted in repowering the Hulda late in 1944. A larger engine—a new 320-hp Fairbanks-Morse Model 25, 8-cylinder diesel—was installed and other alterations were made in the vessel, which included larger crew's quarters and a large towing winch. It is planned to use the vessel for both inland and coastwise service.

Among other towboats in the Portland Tug and Barge Company's fleet is the Watco, powered with a 320-hp Fairbanks-Morse Model 35 engine that has been in service about six years, and the Superior, powered by a 240-hp Fairbanks-Morse Model 35 diesel that has been in service about seven years.





Dutch Cargo Carriers Building at Portland

Post-War Shipbuilding

From an editorial viewpoint this story is probably the most important item we have run this year. We have been predicting foreign orders for American shipbuilding post-war, and here is the first concrete evidence that we were right.

Taken together with the ten C-3 type cargo carriers ordered by The Netherlands from Sun Shipbuilding and Dry Dock Co., this Albina contract gives ample proof that American yards will have considerable business from ship-hungry European ship operators.

Albina is to be congratulated for breaking the ice and getting the first contract. If America's experienced shipbuilders will sharpen their pencils and get down to earth in their estimating they will have here a great opportunity to build real ships for the world's ship operators.

Albina Engine and Machine Works, Inc., shipbuilders and engineers of Portland, Oregon, are busily engaged on an eight-million-dollar contract with the Netherlands East Indies Government that calls for 20 coastal cargo vessels, all to be delivered before January 1, 1946. The first keel was laid on March 16, and that vessel is scheduled for delivery on June 11.

At the ceremony attending this keel laying G. H. van der Stoop, technical representative of the Netherland's Purchasing Commission, made some remarks that are very significant to the future of the American shipbuilding industry. Said he:

"The laying of this keel marks the beginning of a vast ship construction program, and I have reason to believe that more vessels for the Dutch Government will be built at Albina. Dutch shipbuilding facilities are gone. England will not be able to build enough ships for herself. That leaves America as the great shipbuilding nation of the post-war world. It gives me personal pleasure to see these ships being built in so efficient a yard."

These ships are typical East Indies inter-island cargo carriers of welded steel construction and have the following general characteristics:

Length over-all	180′ 7″
Length bp	170′ 0″
Beam, Mld	29′ 0″
Depth, Mld	10′ 6″
Scantling Draft, Mld	8′ 6″
Draft Designed	8′ 0″
Displacement at Designed Draft	850 Tons
Deadweight Capacity	460 Tons
Shp, Designed	250
Speed, Service	8.5 Knots

Primarily designed as peacetime ships to ply the more than 2000 islands of the Dutch Indies, these vessels will be used until the war ends to carry troops and supplies to root out by-passed Japs from those same islands. They will have reinforced bottoms to allow them to slide over coral reefs. The two 26-ft. lifeboats, designed as lighters between ship and shore, also will have reinforced bottoms and sides to negotiate the reefs.

Propulsion Machinery

The main propulsion machinery will consist of one Enterprise Type DMG-6 full diesel engine rated at

275 hp at 275 rpm. This engine will be of the conventional 4 cycle design, having 6 cylinders of 12" bore and 15" stroke, and will be directly reversible. Air starting will be employed, and air will be supplied by an attached two-stage air compressor driven by V-belts through a clutch from the flywheel. Engine speed governing will be by means of a standard marine governor of the flyball manually adjustable type, providing a speed range from 80 to 340 rpm, and capable of being set for any desired engine speed between those limits.

The electric power system will be 115 volt dc supplied by two 40-kw generator sets to be used while handling cargo. The 40-kw units will each be driven by a Venn-Severin marine diesel engine rated 60 hp at 720 rpm, and of the air starting, two cycle, 3 cylinder full diesel type. The generators are Burke Electric Company compound wound 720-rpm marine type, with special insulation for tropical climates. These diesel generator sets will not be arranged for parallel operations, but instead the different units of deck machinery will be capable of being energized from either one or the other generator by a two-bus arrangement of the ship's service switchboard.

A 10-kw diesel generator, designed to provide electric power while under way at sea, consists of a 16-hp Lister-Blackstone two-cylinder, four-cycle, 1200-rpm marine diesel engine, driving a Kurz-Root 10-kw compound wound generator. Driven off this unit will be a Quincy model 2-cylinder, 2-stage air cooled air compressor, rated 11 cfm at 280 psi at about 600 rpm, fitted with a suction valve unloader to maintain automatically the desired air pressure in the receivers. Also attached to this unit will be an auxiliary bilge pump rated 30 gpm at 15 psi and fitted to be driven by separate clutch drive from one of the main generator units.

The pumps, supplied largely by Buffalo Pump Co., will be motor driven, and will perform the usual auxiliary functions.

Deck machinery will consist of four 12-hp cargo winches, a 17-hp anchor windlass, and a 10-hp warping capstan, and is being designed and built by Markey Machinery Company, with Westinghouse as the electrical subcontractor. The anchor windlass is designed for maximum speed and ruggedness to enable it to meet the unusually high demands caused by the numerous calls at ports without wharfage facilities.

Pilot house machinery and quarters will be located aft in the conventional manner. Quarters will be provided for the crew of 16, to which a 6-man gun crew will be added for war operations. There will be one stateroom to accommodate two passengers. Native passengers will be carried on deck.

The two cargo holds will be fitted with roller hatch beams and served by a single mast and four five-ton booms.

The vessels will be built under the special survey of the American Bureau of Shipping to Class A1 Coastwise E.

Our illustration is taken from a painting approved by the naval architect. It depicts a very business-like profile not unlike that of a streamlined Pacific Coast steam schooner.

Shipbuilder Announces Operation Through 1946

Full operating levels will be maintained well into 1946 at Consolidated Steel's Los Angeles Harbor yards, with a huge ship construction and repair program now on its books, according to an announcement made April 23 by Alden G. Roach, president of the corporation, who emphasized the statement that "there will be no reduction in production personnel."

The remainder of Consolidated's heavy schedule for the construction of AV-1 coastal cargo vessels, 47 of which are still to be built at a cost of approximately $90,000,000, will carry the yards through to the fall of 1945, at which time Consolidated will be well under way on the construction of 16 C-2 vessels to be built for the United States Maritime Commission at a cost of over $70,000,000.

In addition, the corporation has entered into a greatly expanded ship repair program. To complement the repair operations at its new Terminal Island Ship Repair Division, it announced that its Pico Street Outfitting Yard in Long Beach is also being converted to ship repair work. The corporation is also carrying on similar work at the San Pedro Lumber Dock and other docks leased for ship repair purposes. Many ships have already been reconditioned and returned to service by Consolidated, and its present repair facilities are operating at full capacity. At an early date, it will install a 14,000-ton floating drydock at its Wilmington shipyard, which yard will be converted to the repair of all types of vessels.

Consolidated's Wilmington shipyard was definitely taken out of the "war baby" class with an announcement by company officials that both the United States Navy and the United States Maritime Commission have sanctioned the continuance of this yard after the war for both new construction and repair of their vessels. Mr. Roach stated that the company is constantly bidding on new contracts over and above those already slated.

The AV-1 coastal cargo vessels now under construction by the company are 324 feet long and have a beam of 50 feet and a depth of 26.5 feet. Rated at 5010 deadweight tons, they are to be used for long-range shallow-draft operation in the Pacific area.

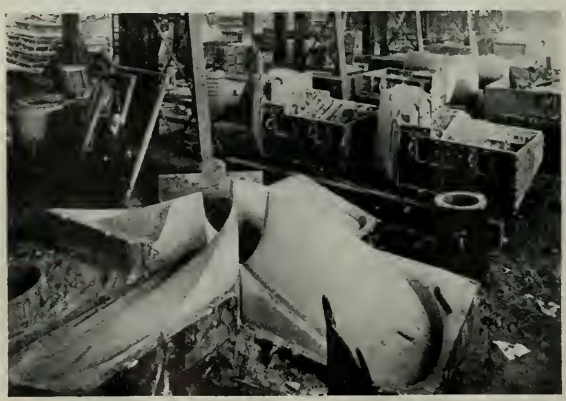
The 16 C-2's, designed for special duty in the Pacific war zones, are 459 feet long and have a beam of 63 feet and a molded depth of 40½ feet. These large vessels, rated at 9643 deadweight tons, are considerably more complex than the AV-1's now being built. Consolidated is no stranger to complicated ship construction. This corporation has built a diversified armada of more than 1500 vessels of various types since the beginning of the war, including everything from landing craft to destroyers. In the list are attack transports, hospital ships, C-1 cargo and passenger vessels, tank and infantry landing craft, frigates, coastal cargo carriers, and barges. Consolidated has delivered almost one billion dollars' worth of merchant and combat vessels to the Maritime Commission and the Navy.



Pattern for a four-bladed propeller is set up with great care. Leading faces of blades are arranged in farm of a cross an foundry floor. Vertically the mold is built up of two main parts, "drag," or lower section, and "cape," or upper section. Mixture of sand and cement is packed about pattern; being porous, it lets steam and gas escape.

1500 Large Propellers A Year

After setting for several hours, "cope" is lifted off, pattern removed, and the two sections exposed to air for 24 hours, then closed, locked together and allowed further drying time. Pattern can be used over and over with little danger of injury or deformation.



ALL THE efficiency of steam boilers and of the engines which use the steam they produce would be useless in driving a ship through the sea without the propellers which transform shaft horsepower into propulsive thrust.

Making these propellers for all types of ships, to meet all sorts of sea conditions, is a highly specialized job which has kept the Cramp Brass and Iron Foundries division of The Baldwin Locomotive Works 100 per cent in the war effort with orders from the Navy and the U. S. Maritime Commission.

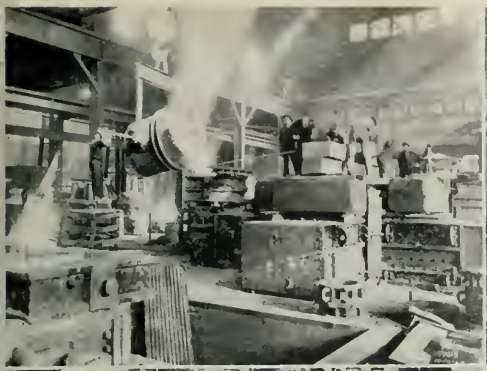
The Eddystone plant of Baldwin, since Pearl Harbor, has turned out, up to September, 1944, 145,176,039 pounds of castings. Most of this tonnage has been in manganese-bronze alloy and has called for rare precision in melting, pouring, molding and finishing.

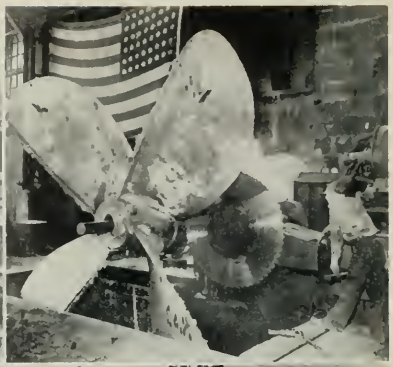
In the large brass foundry the melting capacity is 3,000,000 pounds a month, and the small brass foundry melts a monthly average of 500,000 pounds.

This foundry is now casting as high as 125 propellers a month, approximately 95 for Maritime ships and the remainder for vessels of the U. S. Navy, from battleships to seaplane tenders.

Most of the propellers are for Victory and Liberty ships. The finished screw for a Victory ship is 20½ feet, for a Liberty ship 18½ feet in diameter. In the rough they weigh 54,000 and 22,000 pounds, respectively. The pattern for each is an unfinished bronze casting that, if ground and polished, could serve as a propeller for one of these vessels. All its dimensions are larger than those of the propellers that it helps to produce, the excess allowing for shrinkage in the metal between its molten and solidified states. The larger mass of the rough casting affords compensation for any warping while it is in the mold and also offers leeway in performing the machining and finishing operations.

The Liberty ship screw is revolved 76 times a minute with energy delivered to it by an engine developing 2500 ihp. The tip of each of the four blades circles through the water at a speed of 50 miles per hour while driving at full speed. The propeller must be balanced so that it will turn smoothly, with each blade imparting approximately equal energy to the water in which it is turning.











Upper left: An overhead crane brings a large ladle from the furnace, halts it at exact position to enable two workmen to tilt it and "team" its contents steadily under perfect control. When pouring basin is full enough to assure an even flow into bottom of mold, plug is removed. A worker watches carefully, skims impurities. The big ladle has enough bronze to form propeller and can be poured in five minutes.

●

Upper right: As it comes from the molds, this casting weighs about 28,000 pounds. Some castings weigh as high as 72,000 pounds. Now it heads for the finishing shops, weight 23,500 pounds, to lose 4500 more in the cleaning process. A huge circular saw and air-operated chipping hammers do the trick. It still has to go to the machining shop.

●

Center left: Careful machining further transforms the propeller so that by the time it's ready to ship it weighs 22,000 pounds. Tolerances must be infinitely close in width and pitch. It must also go through a fine balancing operation. Craftsmen check also the tapered bore of the hub which receives the tapered end of the ship's tail shaft.

●

Center right: To get such a finished propeller as is now going to sea, workmen must start with patterns that will allow for plenty of shrinkage, but that is all calculated exactly. Once the screw propeller was an uncertain thing, looked upon with distrust. Researches in model tanks and basins have revealed more of its reactions in the water, especially wake factors due to high rates of speed.

●

Bottom right: A shot of the propeller of the S. S. Peter Silvester, Colship's 31st Liberty ship, launched in 1942. A heavy propeller is like a flywheel in some of its actions. A Liberty ship screw revolves 76 times a minute. Tips of the four blades circle through the water at 50 miles per hour, and blades must strike the water exactly the same blow.

Shipbuilding Yard Fabricating Army Bridges

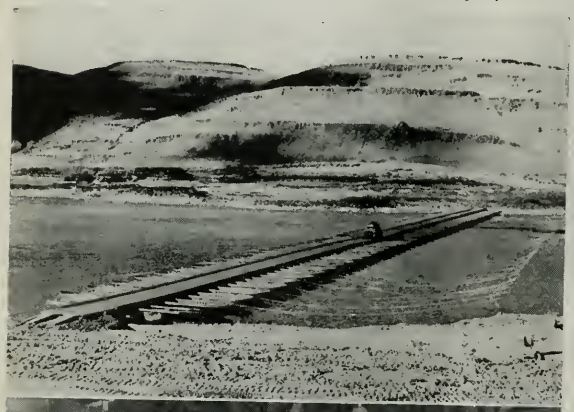
A contract by the Oregon Shipbuilding Corporation with the United States Army Engineers calls for the construction of 4000 aluminum half pontoons at a cost of $12,000,000. Schedules called for the delivery of the first 200 of these by the end of March, 1945, and the balance before September 1, 1945.

These pontoons are of a new type involving special designs and construction features. They will make the crossing of streams much speedier, and with larger and heavier loads. During actual service tests, 201 feet of bridge were constructed in two hours and 12 minutes.

Each half aluminum pontoon weighs 1750 pounds. Ten handles are provided on each side, making it possible for 20 men to carry from place to place with ease. The half pontoon measures 29 feet, 7⅜ inches in length, 6 feet 11 inches in width, and has an over-all depth of 3 feet 4½ inches.

Top: The new all aluminum M/4 bridge developed by the Corps of Engineers is made up of three basic parts, pontoon half boats, removable gunwales and hollow balk. *(Official U. S. Army photo)*

Bottom: An aluminum half pontoon in the shop, Oregon Shipbuilding Corp.





These pontoons were designed by Sparkman - Stevens, naval architects of New York City, and were subjected to every known test at the Stevens Institute of Technology in New Jersey before the design was accepted by the United States Army Engineers.

To form a bridge with these pontoons, three parts are required, a hollow deck balk, removable gunwales and the half pontoons. Two half pontoons locked stern to stern with connector pins can safely support 26 tons, and the bows of the pontoons allow them to ride swift currents. Removable gunwales provide a foundation for the deck balk, installed with lugs and pins.

The hollow deck balk which replaces stringers and flooring in the older type wooden deck bridges is considered an innovation because a single deck balk weighing 215 pounds can be carried by four men, but afloat they will support a 300 pound load. Placed parallel to the traffic flow, they are staggered to distribute load and provide a continuous beam.

One M-4 bridge set provides 436 feet of floating bridge and 180 feet of fixed bridge, a total of 616 feet. Tractors, twin screw power boats and quickway cranes accompany each bridge set. Technically the M-4 bridge will be used in rapid follow-up to assault boat crossing and will be replaced by a Bailey bridge or timber trestle bridge so that the M-4 can be moved forward for new crossings.

The bridge deck is nearly two feet wider than those in present use. The M-4 bridge has been tested to carry safely a 50-ton vehicular load in a current as swift as ten feet per second. They are designed to handle increasingly larger and heavier loads of military traffic. They are lighter, wider and capable of faster construction than any pontoon bridge now in use.

Pacific WORLD TRADE



By T. Douglas MacMullen

Foreign Trade Week

MAY 20-26

More people are directly engaged in foreign trade, and more people are indirectly concerned with it, than a casual reading of statistics would show. Probably, in one way or another, the entire population of the country has a stake in the future of international shipping, if for no other reason than that unsatisfactory trade conditions lead to war, while universally profitable trade tends to lessen tensions.

More specifically, however, trade reaches the pocketbooks of a very large part of our population, and it also affects our ordinary comforts. Foreign Trade Week is the occasion for concentrating attention on these things.

Take imports, for instance.

Do you drink? Of course you do, and quite likely you are therefore enjoying direct benefits of Foreign Trade.

The 140 million dollars' worth of coffee we import from Latin America each year makes possible a 140-million-dollar pay roll in U. S. factories, insurance offices, railroad and steamship companies.

Tea and cocoa account for many millions more, and wine and spirits average about 55 million.

The nickel you drop in the telephone would get no resulting answer if it were not for the imported parts used in the telephone system. And

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NEXT MONTH

Two-way Trade with China

Fresno is a Port

The Banker in World Trade

Foreign Travel

Peru

San Francisco Conference

Maritime Day

MAY 22

the nickel in your nickel is imported. Your automobile would not run without imported parts. Rubber, whether for tires or the heels on your shoes, is an importation that pays for 200 million hours of labor on **exported** goods. If you eat chocolates or wear diamonds, you **enjoy** our foreign trade — and make our industrial wheels hum.

The page you are reading is in foreign trade in more ways than one. For paper and pulp together constitute 10 per cent of all imports—more than any other single item. Next comes rubber at about 8 per cent, coffee at 6 per cent and cane sugar at 5½ per cent.

Crude materials valued at $745,000,000 (1939) comprised 33 per cent of our total imports, while semi-manufactures ($487,000,000) represented 21 per cent more. Thus more than half of our imports were of a nature that required domestic labor to prepare them for market. Our imports are industrial assets — they bring us jobs. Increase the demands for imports and you increase jobs.

If there were no imports, there would be little in the way of exports, and that would be bad for the country as a whole, for the foreign traders, and for the shipping and shipbuilding business. There are some people who think it wouldn't matter much. Farmers, for instance.

The last census showed a U. S.

(Continued on page 288)

"We must learn to trade more with other nations so that there may be—for our mutual advantage—increased production, increased employment, and better standards of living throughout the world."

—President Truman (to Congress)

Our Stock for Trade

An Analysis of Export Possibilities for Metropolitan Oakland Industries

By John A. Sowers
Manager,
World Trade Department,
Oakland Chamber of Commerce.



John A. Sowers

Today everyone is talking and thinking about post-war trade. This is a healthy and desirable condition. However, realizing that the trade world of tomorrow will be determined by many unknown and variable factors, it would not be wise to attempt to predict the exact character or extent of our future business.

Yet we should take stock, for we must live in this changing world, and to have no plan or direction would be disastrous. Too frequently we hide behind our problems and complexities, using them as an excuse for not planning.

Fundamentally, certain basic conditions determine and influence trade They are location, topography, climate, natural resources, transportation facilities, supply and type of labor, and industrial development. Concerning these much has been written, so we will review them only briefly.

Our unsurpassed location has been the subject of much study, and it should continue to be exploited. An elementary analysis of California industries indicates that our climate conditions are ideal for the production of certain agricultural products. These products have provided the basis for definite types of industrial development. Enlarged demands and new developments have established other industries on the Pacific Coast, to which the war provided a further impetus. This expansion demanded additional labor, and the population of Alameda County increased from 513,011 in 1940 to 685,548 in 1944. For the San Francisco Bay Area, the increase was from 1,461,804 in 1940 to 2,044,613 in 1944.

From a transportation standpoint, we could not be more advantageously situated—at the half-way point on our long Pacific Coast line, on the mainland side of the San Francisco Bay, and the terminus for all lines of overland transportation.

So, what of our business of the future? It is our opinion, regardless of competition, that with our natural advantages for agricultural production and our skill and efficiency in the food processing industries, our trade in food products will continue to be large and significant. It is economically sound for us to produce in this area, fruits, vegetables and nuts. During the past three or four years the canning industry of the United States has maintained production of about 385 million cases each year, an increase of more than one-third over the average of the preceding five

Owens-Illinois Glass Company's Oakland plant.



Pacific World Trade

years. Shipments by canners for both war services and export increased from 36 million cases in the 1941-42 season to an estimated 150 million cases in the current 1944-45 season.

Improvements in canning, bottling, drying, dehydrating and packaging will undoubtedly play an important role in the growth and stability of these basic food lines. Dairy products, peanut products, candy and chewing gum are all products that have found overseas markets. Baby foods offer possibilities that cannot be overlooked; dog and pet foods also have interesting possibilities. The food industry, with its many ramifications, is here and should continue to prosper and grow. We cannot "sell it short" in our considerations for world markets.

This area has been developing a pharmaceutical industry that has already established itself in the export field. There is no reason why, in the near future, our production of medicinal products — vitamins, serum and vaccines — should not increase. The character of these products, such as size and relative value, lend themselves beautifully to export business and air transportation.

In the field of chemical production, we are firmly established; the size and importance of our industrial chemical production is well known. Agricultural chemicals, insecticides and pest control materials have an unlimited field. Soap and fertilizers are very substantial industries in this area. Solvents, disinfectants, deodorants, waxes, etc., offer a wide range of products that have export possibilities.

In the field of paint, varnish and enamels we have the major national manufacturers, plus a large number of local plants who have been successful in merchandising their products in foreign lands. Their production has been stepped up to meet war demands, and they will undoubtedly continue to interest themselves in the world market. Closely allied, and a part of this industry, is the manufacture of linoleum and similar



The Paraffine Companies Inc. (Oakland plant).

floor coverings, roofing materials, and the thousand and one preparations that today have so many commercial and industrial uses. The manufacture of plastic products also has made a good start, and we can expect developments in this line that will certainly be of interest to overseas buyers

So far we have suggested largely those products naturally indigenous to this area, or those pretty much allied to primary production. However, we have yet to deal with those related to metals, particularly iron, steel, aluminum and other light metals, and also those products of a more highly developed industrialization process. In these we are not devoid. In fact, the West and the Metropolitan Oakland Area have achieved significant progress that has assured for us a new, permanent place in the industrial picture.

Let us start with steel. Prior to the war we had no local steel mill production. Today we have Kaiser at Fontana, California, and Columbia Steel at Geneva, Utah. These mills have been needed to supply war production requirements, principally ship construction, but now they must look to the immediate Western states and the export market. To outline in any detail the probable developments in this field would mean an analysis of the entire industry. We shall here try only to suggest some broad outlines and to enumerate other industries that have been established in this area whose export position should be further strengthened

In primary steel forms and shapes, we have the building and construction industries that require various structural shapes, such as reinforcing bars, roofing, siding, nails, industrial wire cloth, stucco matting, and the like. Consider the construction requirements of the world. It is no visionary dream to expect substantial export business in these lines. Further interest in air conditioning

(Continued on page 283)

Shipments of Marchant calculators for overseas destinations.



Proposed Sea-Air Service

Refuting Some Misconceptions

By Lewis D. Parmelee

Executive Vice-President, Atlantic Gulf and West Indies Steamship Lines, and President of the Propeller Club, Port of New York.

One of the most important decisions facing our Government today involves the question of whether steamship companies will be allowed to participate in international air transportation. In a recent speech before the New York Board of Trade, L. Welch Pogue, Chairman of the Civil Aeronautics Board, made some comments on this subject which should be thoroughly discussed.

I believe Mr. Pogue would not deny the importance of maintaining and fostering the development of the American merchant marine after this war. Throughout the course of the war, our merchant marine has proved that it is still the backbone of our military transportation system, both as to movements of troops and supplies. While the air transport service has been enjoying headlines and publicity because of its spectacular and exciting activities, our merchant marine has, without such fanfare, been doing the lion's share of the wartime transportation job by devoting its entire energies to movement of troops and material to war fronts in all parts of the world. This merchant fleet, which is so vital to our national security, must be preserved and maintained after the war.

Mr. Pogue claims that our merchant marine will not suffer to any appreciable extent if steamship companies are forbidden to operate international airlines. In fact, Mr. Pogue believes that our steamship companies will benefit indirectly from post-war air transportation even though they are not allowed to participate in it directly.



Lewis D. Parmelee

He contends that in the post-war world the faster means of travel provided by the airplane, plus low air fares, will produce increased trade and commerce between the United States and other nations, and that such increased trade will mean increases in shipments of bulk cargo on our merchant ships, thus enhancing the prosperity of our merchant marine. While we all hope that the post-war period will bring about a greater interchange of passengers and freight between nations, Mr. Pogue's assumption that these trade increases will mean more cargo business for American flag steamship companies does not necessarily follow. The increased cargo business will not **automatically** flow to American flag carriers. An American businessman's choice of carriers is influenced by other reasons than the flag the carrier flies. Cost, convenience, quality of service, etc., are factors that govern his choice, and just as important is the fact that the foreign purchaser generally controls routing. Such being the case, American flag carriers can hope to capture their fair share of post-war cargo business only if they are able to compete successfully with the traditionally more powerful shipping interests of other countries. There cannot be any possible benefit to American flag carriers from an increased tempo of world trade after the war unless they are given an opportunity to compete effectively with foreign flag carriers.

In the past, a steamship company's passenger service afforded a means of contact with shippers or potential shippers, and was most effective in building and maintaining cargo business.

If, after the war, businessmen travel on American flag air lines, which have no connection with American steamship lines, our steamship companies will have lost their strongest and most effective contacts for procuring freight business. It will become more difficult than ever for our steamship companies to compete with foreign flag carriers for freight business.

This competitive disadvantage will be aggravated by the fact that a considerable number of foreign flag steamship companies will be operating combined sea-air service after the war. In Great Britain, Sweden, Holland, Portugal, France and Norway, steamship companies have already formed air transportation companies, or are in the process of organizing such companies for the purpose of offering combined sea and air service. Under the "five freedoms" policy of international air transportation which is favored by our Government, these foreign flag sea-air carriers will be given free access to United States gateways for the purpose of carrying passengers between the United States and foreign destinations. Both American and foreign businessmen will travel over the air routes of such carriers as well as over the routes of American flag air carriers. As a result a large cross section of poten-

tial cargo shippers will constantly be exposed to direct contacts with foreign carriers operating both a sea and an air service. We can be sure that these highly successful and resourceful foreign carriers will use this valuable contact as a means of procuring for themselves the sea and air cargo business of these air passengers. And the flexible service which can be supplied by a single company operating both sea and air transportation will be most attractive.

It is quite evident, therefore, that despite greatly increased foreign trade after the war, our merchant marine cannot hope to capture its fair share of this business unless American flag steamship companies are given the same opportunity as foreign lines to enter the field of air transportation. Should our shipping interests be placed on a competitive parity with these foreign interests, we should be able to increase immeasurably the volume of cargo carried by our merchant marine in the sea lanes.

A steamship operator conducting both sea and air service will have every reason to exploit air transportation to the fullest extent, because every air passenger as well as every sea passenger will not only mean revenue to the company, but will also provide effective contact with potential cargo shippers. In fact, steamship companies, which have been building up foreign contacts and good will on their trade routes for many years, will be in a much better position to compete with foreign carriers for post-war transportation business than would domestic airline applicants which have had no experience in the complexities of international trade, and which would necessarily have to expend valuable time acquiring "know-how" and building up good will while established foreign carriers are obtaining most of the business.

Mr. Pogue makes no allowance for the importance of passenger traffic in developing freight business for a steamship line. This "blind-spot" is clearly shown by his statement that the diversion of passengers will not seriously affect steamship companies, because only first and cabin passengers will be diverted to air, and as a result steamship companies will continue to carry second, third and tourist class passengers. He points to the fact that in 1938 53% of all sea passengers traveled first or cabin class and 47% traveled second, third or tourist class. He concludes from this that only approximately 50% of the passengers normally carried by steamship will be subject to diversion to air transportation.



Those conclusions of Mr. Pogue's must be challenged. In the first place, the loss of 53% of any business can hardly be regarded as anything but serious. In the second place, Mr. Pogue ignores the very important fact that first and cabin class passengers are the cream of the steamship passenger business, and that it is the profit on this class of business that permits the carriage of second, third and tourist passengers at extremely low rates. Thirdly, as before noted, Mr. Pogue ignores the importance of first class and cabin passenger traffic to the production of freight business. It should therefore be clear, Mr. Pogue to the contrary, that the loss of first and cabin class passengers to air transportation would bring about a serious dislocation in the passenger business of American steamship companies, especially if they are not allowed to compete with foreign flag carriers offering coordinated sea and air transportation services.

Furthermore Mr. Pogue's passenger business figures are averages of all American steamship companies and are misleading when applied to the operations of specific steamship lines. For instance, passenger business of the New York and Cuba Mail Steamship Company consists almost entirely of first class passengers. In the decade before the war 96% of its passengers traveled first class. Obviously, Mr. Pogue's conclusion that steamship companies will not be affected by diversion of first and cabin class passengers to air transportation does not apply to these steamship companies. Unquestionably they will be drastically affected by such diversion.

Mr. Pogue also points out that in 1938 only 25% of the gross revenues of passenger traffic between the United States and foreign countries went to American flag steamship companies, whereas foreign flag carriers enjoyed 75% of such revenues despite the fact that 70% of gross passenger revenues were contributed by United States residents. As a result, Mr. Pogue says, even though all first and cabin class passengers are diverted to air, most of the passengers so diverted will come from foreign steamship companies rather than from American flag steamship companies. The gain in air traffic volume carried by American flag carriers will more than offset the loss to our steamship passenger business, in Mr. Pogue's opinion, thus resulting in a "net gain to United States interests." In other words, Mr. Pogue takes the attitude that our pre-war steamship passenger business could just as well be written off the books because it didn't amount to much, anyway. Such an attitude is commensurate to signing the death warrant of our passenger steamship operations and is contrary to public interest and the demands of national security.

It should also be noted that Mr. Pogue here again bases his arguments on an **average** figure, which does not reflect the true situation in particular shipping areas. While it may be true that in 1938 only 25% of gross revenue from all passenger

traffic between United States and foreign coutries went to American flag carriers, Mr. Pogue failed to break down these figures to show, as an example, that in the trade between the United States and the Caribbean area far more than 70% of the passenger revenues went to American flag steamship companies. It is readily apparent, therefore, that United States shipping in several important trade areas would be even more seriously affected than would foreign shipping. In such areas there would be no "net gain to United States interests," but rather a large loss.

Here is another example of the inequities which will result to specific steamship lines, if Goverment policies are based on average figures for the entire industry. Mr. Pogue states that American steamship companies will not suffer from diversion of passengers to air because only 8% of the steamship companies' aggregate revenues have been derived from passenger traffic. This figure is indeed misleading, for it includes many companies operating tankers and other non-passenger vessels. On the other hand, a number of companies derive a substantial proportion of their revenues from passenger operations. For instance, The New York and Cuba Mail Steamship Company and The New York and Porto Rico Steamship Company both derive as much as one-fourth of their revenues from passenger traffic. Certainly the potential diversion of one-fourth of the revenues of such companies, the operations of which are so vital to our national security, represents a serious problem, which cannot lightly be brushed aside.

I think most far-sighted people now agree that we must not allow our merchant marine to deteriorate as it did after the last war, but on the other hand should exert every effort to build a strong and self-reliant merchant marine capable of serving our defense needs in time of emergency, as well as the public interest at all times. The pursuance of a short-sighted policy toward our merchant marine, which would deny it the right to participate in air transportation, or, in other words, to forbid it to modernize its equipment to meet competition with foreign coordinated sea-air services, would work irreparable harm to the future of our overseas shipping. Yet this is just the shocking situation which would result from Mr. Pogue's indicated policy, as I think this refutation of his arguments shows.



While private shipping and airlines operators are vitally concerned with this question of whether steamship companies shall participate in air transportation, we should never lose sight of the fact that the real issue is much more fundamental than a choice between private interests. The fundamental problem is the formulation of an international transportation policy which will best serve the public interest and our national security, regardless of the private desires of either our steamship companies or our domestic airlines.

The domestic airlines, who now have aspirations of international scope, have consistently taken a "dog in the manger" attitude in attempting to keep "outsiders" from entering the field of air transportation. This attitude is patently based on purely selfish motives.

Pacific WORLD TRADE

While steamship operators are not free from motivations of private interest, it can be said to their credit that they have not adopted the intransigent attitude of our domestic airline operators. Our steamship companies lay no claim to an exclusive right to carry goods and passengers in foreign trade and commerce, simply because international trade and commerce has traditionally been developed and fostered by them. To the contrary, our steamship operators fully expect that there will be other American air carriers competing with their proposed air services. Such competition is undoubtedly in the interests of the traveling public.



Mr. Pogue in his address states, and rightly, that after the war the United States will be in a position to capture a lion's share of the air transportation business of the world. He does not, however, state the equally obvious fact that we will also be in a position to become, for the first time in generations, a dominant factor on the sea, if a sensible transportation policy is followed.

In arguing against steamship companies' operating air services, however, Mr. Pogue advances no reasons to show that they could not capture as great a share of the air transportation business in the areas they serve as would domestic airlines. Yet there is every reason to feel that steamship companies would be in a better position to exploit international air transportation because of their long experience with foreign trade and commerce.

At the same time—and here is a point which Mr. Pogue completely overlooked—if steamship companies are allowed to offer combined sea-air services, our merchant marine will be in a position to capture much of the passenger and cargo business which has in the past been carried by **foreign** carriers. A substantial portion of the 75% of gross revenue from passenger travel originating in the United States—formerly going to foreign flag carriers—will be earned by American flag carriers. This will only be possible if American flag carriers are permitted to compete effectively—through combined sea-air service—with foreign companies offering similar facilities. Such an enlightened policy will mean a net gain to the United States on the sea as well as in the air, whereas Mr. Pogue's policy would show a gain only in air transportation, while doing irreparable injury to America's merchant marine. Certainly a policy which promises expansion **both** on the sea and in the air is preferable!

I therefore urge that the fundamental objectives of our international transportation policy include not only international airlines but some American flag carriers, offering through single companies the benefits of coordinated sea and air service, in those areas which careful study designates as most vital to American shipping interests. Only in this way can we insure our national security through the maintenance of a strong merchant marine, and assume leadership as a shipping nation.

The Railroads and Foreign Trade

By W. W. Hale
Vice President—System Frt. Traffic, Southern Pacific Co.

The pending complaint of the Attorney General against the Western railroads, referred to in Mr. Hale's article, is a matter of interest to all shippers. The conference method of rate fixing, long approved by the Interstate Commerce Commission and always subject to review by that body, has worked out well and should not be lightly discarded or attacked.

The railroads are a vital instrument of foreign trade and too often lack the support of trading interests. If the complaint referred to is sustained, there will be many phases of trade procedure that will require adjustment, not the least of which are train schedules, through rates, and export rates. Many if not most freight rates are initiated by the shippers themselves and worked out in the conferences.

Foreign traders will do well to watch and study the Government's action, and make themselves heard when their interests are affected.—Ed.

The United States has come into a position of recognized leadership in industry and commerce. We not only produce more, but consume more per capita than any other country in the world. Before the present war we were producing more than we consumed, so we had to rely on expansion of our foreign markets if we were to continue to prosper.

The war has affected the normal flow of goods and services between countries, but it is generally expected this commerce will be resumed in larger volume than ever with the return of peace. Foreign commerce in the past has meant much to our nation's business, and from all indications it is destined to mean considerably more.



W. W. Hale

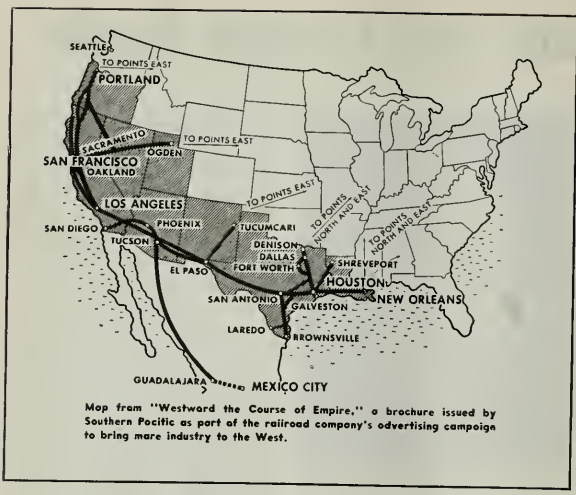
Our railroads, serving the ports from which America's greatest merchant marine in history will sail when peace returns, are deeply interested in foreign trade, especially in that potential trade with an estimated more than one billion persons across the great Pacific Ocean in the Orient and South Pacific, and with an additional one hundred million in South America. All of these peoples are reached directly through our ports, served by our railroads.

Southern Pacific, strategically serving America's West Coast and Gulf ports, is especially interested, as we have been since the earliest pioneer days. We expect to haul more import and export commodities than ever before when this war is over, and we expect to be in better shape in physical facilities and experienced personnel by reason of the tremendous war load we have had to handle. Our company has made many additions and improvements to facilitate the haulage of the war load, improvements which have greatly increased the carrying capacity of our railroad.

Foreign trade is of great concern to all the railroads and transportation agencies. Foreign trade is highly competitive, and if all the agencies involved do not work together the United States cannot expect to hold her place in world commerce. This means that the various railroads, the port authorities, the steamship and shipping companies, and many others must cooperate to provide the greatest possible efficiencies in services and schedules and the lowest costs for American producers and consumers. One railroad, one steamship company, or one port cannot meet the situation single-handed.

For years it has been customary for these various agencies to consult together and solve the many problems arising in the handling of domestic and foreign trade. It will no longer be permissible for different agencies involved to arrange among themselves the coordinated services, schedules and charges which are necessary to enable this country to participate in world trade if the Department of Justice is successful in obtaining an interpretation of the Anti-Trust Laws as prohibiting agreements among competing carriers in matters of rates and services as contemplated by suit recently filed against the Western railroads at Lincoln, Nebraska.

The conference method of handling rate and service matters has been in effect for many years. It is the only practical method under which carriers can comply with the terms of the Interstate Commerce Act, and it has always been believed that this method is not in contravention of the terms of the Sherman Anti-Trust Law. There is no other practical way for carriers to make rates in conformity with the law. There was recently introduced in Congress bill H. R. 2536, designed to remove the uncertainty now existing in the minds of some with respect to seeming overlap between the Transportation Act and the Sherman Anti-Trust Act. In addition to



Map from "Westward the Course of Empire," a brochure issued by Southern Pacific as part of the railroad company's advertising campaign to bring more industry to the West.

accomplishing this, bill H. R. 2536 will specifically clarify the Interstate Commerce Commission's authority to regulate carriers' conferences to make certain they are organized and conducted in the public interest.

This bill was considered by the United States Chamber of Commerce, and the following is the report of the Transportation and Communications Department Committee of that organization, approved by the Board of Directors of the Chamber on March 23-24, 1945:

"Recent efforts by the Department of Justice to obtain court interpretation of the anti-trust laws as prohibiting agreements among competing carriers in matters of rates and service, accentuate the need for prompt clarification of the law in these matters. We believe that the present practices are in the public interest and are essential to the orderly conduct of transportation. We further believe that, with certain safeguards outlined below, the agency created by Congress over the past years for the express purpose of regulating the rates and services of interstate carriers can be relied upon to do this in the public interest, and that carriers complying with the orders of these agencies should be immune from application of the anti-trust laws to the practices involved.

"Bills before the last Congress dealt only with conference ratemaking. This ratemaking system has been developed over a period of many years with the full knowledge and implied approval of the Interstate Commerce Commission, which has and on occasion exercises the same veto power over rates proposed by conferences as over those initiated by individual companies. Subsequent to the hearings on these bills, however, the Department of Justice brought the civil action now pending against the Western railroads. This action covers not only conference ratemaking but also agreements as to train schedules and many other service features, and it is evident that to clarify the situation with respect to these other important operating practices, new legislation is needed applicable to them as well as to conference ratemaking.

"A more comprehensive bill, H. R. 2536, has recently been introduced in the present Congress. It provides that a carrier subject to the Interstate Commerce Act may submit to the Commission any agreement between or among two or more carriers, other than for a pooling, consolidation, acquisition or other transaction to which Section 5 of the Interstate Commerce Act applies, and the Commission is to approve or deny it according to whether it finds it in furtherance of the national transportation policy declared in the Act. It may prescribe any conditions it deems necessary before granting its approval, and may by order after notice terminate its approval or modify the conditions. With these safeguards, and the further proviso contained in the bill that such an agreement must not deny carriers not concurring in it reasonable opportunity to act independently, parties to it are given immunity from the anti-trust laws with respect to the entering and carrying out of the agreement.

"We understand that this legislation is designed to permit carriers to enter into proper agreements as to rates and service and will preserve to the public and the carriers the advantages that have accrued from the long-established and now-functioning conference ratemaking procedure. We believe in these principles as being in the public interest and strongly urge prompt legislation embodying them."

The Board of Pacific American Steamship Association, recognizing importance of H. R. 2536, approved it and authorized cooperation with others supporting its favorable passage. It is of utmost importance that all those participating or interested in foreign trade also join in supporting this bill vigorously.



Pacific World Trade

The Colleges and World Trade

We believe that Basil Harris has made a contribution to the development of world trade that will have lasting benefits far more expansive than even appears in the responses to his questionnaire. The promotion of trade has been left, generally speaking, to the established traders, assisted by occasional live-wire local chambers of commerce.

Among major beneficiaries of foreign trade are steamship and insurance companies. Their facilities for reaching the non-shipping industrialists are well organized, and they should find new ways for thus expanding their own and their country's prosperity.

Mr. Harris has taken a strong lead in seeking to sell the idea to American youth, and to train them in commercial relations. His letter to 35 college heads closes with this:

"Would you be willing to express your views, for possible publication, and if so would you state your replies on these three questions?:

"(1) In the light of the enlarged part which the United States is to take in the world picture, do you believe the program of our universities and colleges should place greater stress upon our position as a maritime nation?

"(2) Do you favor having our universities and colleges more broadly treat the background of the United States as a trading and shipping nation—give more emphasis to the wider activity of the United States in world trade and world shipping?

"(3) What particular proposals do you recommend to achieve this objective?

"An expression of opinion by you as an outstanding figure in the field of education can be of considerable value, I believe, in helping to shape lasting peace."

By Basil Harris

President United States Lines

The United States will reestablish herself as a maritime nation of first rank in the post-war world. Only world horizons will encompass her avenues of trade and shipping. With the ending of hostilities, we will be looking ahead toward a broad vista of orderly relations and peacetime commerce. We will be prepared to participate with the rest of the world in those new relationships which are to be an important factor in the establishment and maintenance of peace.

In planning to set up and retain for the United States a world trade, our country's educational leaders consider it vital that in colleges and universities the training of our young men and women shall be keyed to the greatly enhanced position and activities of the United States in the post-war period.

Representing a broad cross section of educational thought, presidents or department heads of 35 major institutions of learning have subscribed to this viewpoint in answering communications recently addressed to them by me as president of the United States Lines. They express themselves generally in accord with the desirability of placing greater stress, where our educational system is concerned, on foreign commerce and shipping because of the important role the United States is destined to play as a maritime nation. Declarations such as these from outstanding authorities constitute a favoring wind along the course charted for American ships and foreign trade in after war years.

It is important that the educative processes acquaint the future thought leaders of our country with the value of American ships and world trade to national economy and the part these twins will play in extending the "Good Neighbor" policy to the four corners of the earth. Since the United States is going to take a larger part in world affairs and world commerce, education, more than any other force, can be of inestimable value. The United States is in the world picture to stay and it is reassuring to know that educators fully realize this. The United States is likewise on the seas to stay and the educators further agree that the schools should take account of this fact.



Basil Harris

Recognition by university spokesmen of the duty that education must discharge in emphasizing the true aspect of the United States as a shipping and trading nation is of unusual and timely interest. They offer no panaceas; they vary on methods suggested; but they see

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what must be done. I am sure that, like myself, all persons closely associated with foreign trade and shipping are indebted to the gentlemen whose letters appear herewith for their opportune expressions of opinion on this major subject.

* * *

Quotations From Replies:

"In its role as a center of research and instruction, the University of Illinois can best contribute to the activities of the United States in world trade and world shipping by offering appropriate courses of instruction and by carrying out research projects in all the major areas of finance, sources of raw materials, types of international organization, the histories of other nations, the course of scientific development, and in those subjects in the humanities which relate most directly to international understanding."

—Dr. A. C. Willard, president, University of Illinois.

* * *

". . . Surely our colleges and universities, if they are any good, will take into account the development of world trade and world shipping as affecting the United States."

—Dr. Virginia C. Gildersleeve, dean, Barnard College.

* * *

"The University of Maine has traditionally been interested in the field of international trade and commerce and in the United States as a trading and shipping nation. . . .

"We have tentative plans for emphasizing even more than we have in the past the place of the United States in world affairs which of necessity means more emphasis on maritime history and international trade and commerce.

"I agree with you that stressing the place of the United States in the world at large will help us in our efforts to bring about a more lasting peace than heretofore."

—Dr. Arthur A. Hauck, president, University of Maine.

* * *

"I agree thoroughly with you that now our country has opened upon the broader aspects of Commercial and Political affairs of the world, we must have a very far-reaching plan and view of the entire situation. And one of the most practical ways is to take into account, what has been long neglected, that which should be done in the maritime role this country should play.

"As for the three questions you put:

"(1) The colleges and universities most certainly should place greater stress upon our position as a maritime nation.

"(2) The universities and colleges treat in a broader way the background of the United States as a trading and shipping nation, with emphasis on the possibilities of world trade and world shipping.

"(3) As for the specific possibilities, I can see unlimited opportunities of bringing this matter to the attention of the students in any number of courses."

—Father Edward J. Whelan, S.J., president, Loyola University of Los Angeles.

* * *

"The least that should be done in colleges interested in providing a basic college education is to expand the space or time devoted in American economic history courses to international commerce and ocean shipping."

—Dr. Thomas S. Gates, chairman, University of Pennsylvania.

* * *

"(1) I do believe the program of our universities and colleges should place greater stress upon our position as a maritime nation.

"(2) I favor our universities and colleges more broadly treating the background of the United States as a trading and shipping nation."

—Dr. Daniel L. Marsh, president, Boston University.

* * *

"As I see it, your inquiry did not rest specifically with the Business School, but rather more in the general field of education. As you know, we here are much interested in international trade and the development of our foreign economic policies.



"You may also know that recently we have undertaken a study on behalf of the Maritime Commission and the Navy on the broad question of the future of shipbuilding and the shipbuilding industry."

—Dr. Donald K. David, dean, Graduate School of Business Administration, Harvard University.

* * *

"While we are located in the interior of the country, we are far from being unaware of the importance of our American position, emphasized as it is by our emergence as a world power. The maritime responsibility pervades a good deal of our teaching but does not reach all students and will not until some sort of required course is prescribed. I hope we shall take this step during this academic year."

—Dr. Deane W. Malott, chancellor, The University of Kansas.

* * *

". . . The University of California has long given courses which deal with the constantly changing features of United States industry and commerce. These courses include offerings in foreign trade, inland and maritime transport, marketing, international relations, foreign exchange, and discussions of the country's economic and political history up to recent times."

—Dr. Robert G. Sproul, president, University of California.

* * *

"I quite agree with the premises in your letter. I don't have any particular program to advocate but I do think that there will be a gradual increase of emphasis on our international position inevitably and along with that obviously would grow a keener consciousness of our knowledge of world trade and world shipping."

—Dr. Harry W. Chase, chancellor, New York University.

* * *

"There is no question but that the colleges should give due weight in their educational programs to the importance of our nation's position as a maritime power. . . . It is the University's intention, however, to reaffirm its interest in these features of national policy and to extend the amount of instruction given in the various departments."

—Dr. Charles Seymour, Yale University.

* * *

"Any nation with exposed coast lines such as ours has an unquestioned duty to emphasize the necessity of maintaining an adequate and well-balanced merchant fleet. Moreover, our strategic geographical location, together with our resources and production facilities, marks us as the one nation capable of bringing a good measure of economic well-being to our companion nations in other continents. To achieve this goal, we must have the medium of expressing our desire to participate actively in world economic affairs; and the service servant of overseas trade is ships."

—Father J. Hugh O'Donnell, president, University of Notre Dame.

* * *

"(1) Yes, I believe the program of our universities and colleges should place greater stress upon our position as a maritime nation.

"(2) Yes, I favor having our universities and colleges more broadly treat the background of the United States as a trading and shipping nation—give more emphasis to the wider activity of the United States in world trade and world shipping.

"(3) Our college courses in industrial and economic geography, economics, marketing, and finance, as well as in history and government, and the modern languages, will be expected to revise their course objectives in the light of the new position of the United States in the post-war world. Some new courses will be organized as soon as trends are more definitely established."

—Dr. W. S. Gamertsfelder, president, Ohio University.

* * *

"(3) A careful inquiry should be made into the text matter of the histories of the United States with a view to their revision to bring out into stronger relief our country's development through world trade and world shipping. In the colleges and universities having business administration courses, I recommend the inclusion of studies of overseas trade and shipping."

—Gen. C. P. Summerall, president, The Citadel.

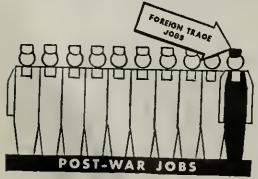
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"In the development of any such program, I feel sure that our educational institutions will be grateful for any practical suggestions you have to offer."

—Dr. Robert C. Clothier, president, Rutgers University.

* * *

". . . Our nation's contacts with the outside world are principally by sea. The cargoes to be carried, the ships or planes to transport them, and the armed forces to defend the sea lanes should be brought together in a well-integrated course presentation available to all





tudents interested in economics, history, geography or international trade."
—Dr. Harold W. Dodds, president, Princeton University.

• • •

". . . I think that teaching follows basic interests and that now that the position of the United States in the world again reemphasizes these factors they will inevitably get more attention."
—Dr. Henry M. Wriston, president, Brown University.

• • •

". . . I believe you have a real point. Vassar College is one of the few institutions in the country that gives annually a prize for the best essay on shipping. We also have an endowment for books on shipping. . . . We shall be glad to have your suggestions as to ways and means of incorporating this important subject more fully in our work."
—Dr. Henry N. McCracken, president, Vassar College.

• • •

"If we are going to maintain our port in the world picture, we certainly should enlarge on our maritime interests in colleges and universities.

"We believe so strongly in this that we are establishing an institute of world economics and politics for the purpose of research and teaching in the field of foreign relationships including foreign trade work."
—Dr. H. C. Byrd, president, University of Maryland.

• • •

"(1) Yes, decidedly.
"(2) Yes, without hesitation or apology.
"(3) Formal course work, preferably sufficient to justify a student 'major,' including:
"(a) Ocean shipping.
"(b) Area studies (Western Europe, Latin America, Far East and Australasia, Mid-Eurasia, and Mediterrania), each to cover the resource patterns, commodity trade, and 'invisible' trade impacts.
"(c) Two or more formal courses in foreign trade, with heavy emphasis upon exporting and importing.
"(d) International economic relations.
"(e) Tariffs and tariff policies.
"(f) Merchant Marine policy—foreign and domestic.

"This bare outline could be enlarged upon almost without limitation. I do not hesitate to affirm that our neglect in the field of international relations in past years has cost, and is costing, untold treasures in life and money."
—Dr. R. B. Von Klainsmid, president, University of So. California.

• • •

"(1) I believe that University curricula should place greater stress upon the position of the United States as a maritime nation.
"(2) I favor greater emphasis upon world trade and world shipping."
—Dr. L. H. Crear, dept. of history & political science, University of Utah.

• • •

"It is pleasing to learn from your letter that you are trying to emphasize to the university world the importance of showing the new place that the United States must take in the world picture, particularly from the standpoint of world trade and world shipping."
—Dr. R. L. Wilbur, chancellor, Stanford University.

New Steamship Line Launched at Los Angeles



Harry S. Scott
President General Steamship Co. and President American Pacific Steamship Co.

A new Los Angeles steamship ompany to operate in foreign serve has filed its articles of incorporaon at Sacramento. Headed by Harry Scott of San Francisco, the Ameriin Pacific Steamship Company will aintain its head office at Los Anles, whence comes most of its capal and officer personnel.

The company plans to schedule gular sailings from Seattle, Portnd, San Francisco, Los Angeles and in Diego to the United Kingdom orts of London, Liverpool and Manhester, and will seek to specialize in fresh and canned fruits and vegetables, for which post-war Europe will provide an almost unlimited market, and which in the past have been carried largely by foreign vessels.

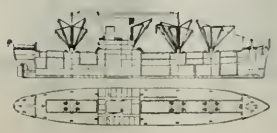
It is planned to purchase six C-2 cargo-passenger ships from the Maritime Commission. These 459-foot vessels will have a cargo capacity of 8055 tons with 100,000 cubic feet of refrigerated space and accommodations for 12 passengers. A 90-day turn-around is planned, with sailings every two weeks.

In addition to President Scott, the organizing directors include: Eugene Overton, Los Angeles attorney and president of the Los Angeles Board of Harbor Commissioners; Emerson Spear, vice president of Pacific Wire Rope Company, Los Angeles; Morgan Adams, president of Mortgage Guarantee Company, Los Angeles; Willard W. Keith, president of Cosgrove & Company, Los Angeles, average adjusters and insurance brokers; John Cosmas, president of Standard Shipbuilding Company; R. V. Winquist, vice president of General Steamship Company; and Dwight Hill of Seattle and San Francisco. Mr. Overton is vice president of the new company. These are largely the same group which formed the Los Angeles Tankers Operators Inc. in 1943, whose successful tanker fleet now numbers upward of 50 vessels.

Harry S. Scott is president of the General Steamship Company of San Francisco and R. V. Winquist is vice president and traffic manager of the same company, which will serve as agent for the new company in Seattle, Portland and San Francisco. The Los Angeles office is in the Spring Arcade Building, where the traffic and operating staff is being formed.



The C-2.
This is the type of vessel contemplated for the new service.



Pacific World Trade

THE UNITED NATIONS

AN ORGANIZATION FOR PEACE AND WORLD PROGRESS



ENCOURAGES NATIONS TO COOPERATE

Seeks solutions to pressing political, economic, and social problems and helps nations to cooperate in solving them.



PROMOTES PROSPERITY

Helps nations work together for post-war reconstruction, increased trade, dependable money, and economic development.



ADVANCES SOCIAL PROGRESS

Helps nations to raise standards of living, health, and education to achieve a richer life for all.



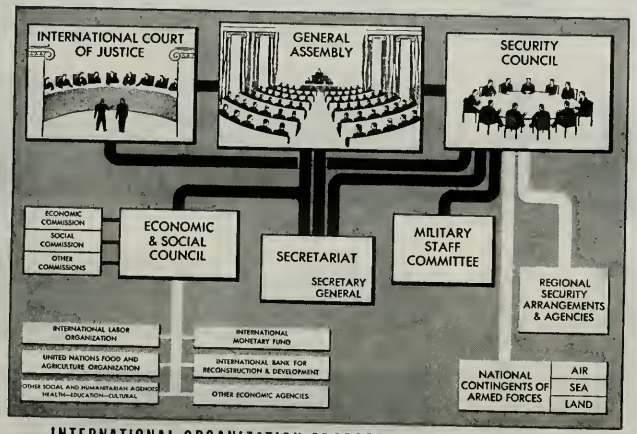
FOSTERS FREEDOMS

Cultivates respect for human rights and fundamental freedoms, to insure the free flow of knowledge essential to material and spiritual growth.



COORDINATES INTERNATIONAL AGENCIES

Assures coordination and cooperation among the international organizations working on vital problems.



INTERNATIONAL ORGANIZATION PROPOSED AT DUMBARTON OAKS

The Proposals were recommended to their governments by the representatives of the United States, Great Britain, USSR, and Chino and released on October 9, 1944. They are offered for full discussion by the governments and peoples of the United Nations.



ADMITS NEW MEMBERS TO UNITED NATIONS

Brings in new member nations and, if necessary in the interests of peace, expels members or suspends their rights and privileges.



FOR FURTHER INFORMATION ASK YOUR LIBRARIAN



MAKES PLANS TO CONTROL ARMAMENTS

Elaborates plans for the regulation and limitation of armaments.



INVESTIGATES DISPUTES BETWEEN NATIONS

Finds out about differences or disputes between nations that might lead to international friction or cause a threat to the peace.



SEEKS PEACEFUL SETTLEMENTS

Urges nations to settle their disputes by peaceful means, including appeal to the International Court of Justice.



DECIDES ON MEASURES TO KEEP THE PEACE

Security Council decides what steps should be taken if a dispute continues and war is threatened.



TAKES POLITICAL AND ECONOMIC ACTION

Cuts off trade, communication and diplomatic relations with nations threatening the peace. Member nations cooperate as requested



TAKES MILITARY ACTION

The San Francisco Conference

So much has been said about the United Nations Conference on International Organization at San Francisco that there is a general impression in the public mind that all of the world's post-war problems are to be solved there. Such is far from being the case. The primary purpose of the conference is the establishment, as the name implies, of an international organization for the maintenance of peace.

At Dumbarton Oaks certain proposals for world security were advanced. At San Francisco these proposals, if agreeable to the United Nations, are to be developed further and put into effect when the respective governments approve them.

The proposed United Nations organization is charted on an adjoining page, and while it will be noted that certain economic matters, including foreign trade, are included, the primary purpose of the organization is world security, and all other matters are incidental.

There will be weeks of argument on every phase of the organizational set-up but, since the original proposals were largely formulated by the American Government, most of the criticism will come from foreign delegations. The American delegates may argue among themselves, or in the General Assembly, but will vote as a unit. It is probable that the ultimate conclusions will be largely along the lines of the Dumbarton Oaks proposals, although there have been certain notable suggestions for clarifying or strengthening the proposals during recent weeks.

Probably the most notable suggestions have been made by Herbert Hoover. At all events, most of the criticism seems to follow the lines of his suggestions.

One of these suggestions is that international law be codified into a Bill of Rights so that the nations will know just how far they may go in their dealings with others.

Another suggestion is that the General Assembly consist not of **all peace-loving nations** but of **peace-keeping nations.** A third suggestion is that "aggression" be defined so as to include **"infiltration."**

Pacific Marine Review is accredited to the Conference, and any matters relating to World Trade or Shipping will be fully reported herein.

Beyond these suggestions is the over-all criticism that the members of the Security Council be permitted to veto any action against its own members and the added objection to assigning any of a nation's sovereign power to any super-government.

If these major obstacles can be overcome, or the problems solved to the satisfaction of everyone, it would seem that the San Francisco Conference will have a place in world history beyond that of any meeting in all the past ages, and this little period of time that we are now passing through will extend its benefits for untold generations into the future.

World trade and social advancements need not fear a world at peace.

"Carro!"—"Auto-Til-Lidge!"—"Taxcn!"*

More than 70 Yellow Cab drivers speaking 15 different foreign languages will help make delegates to the United Nations Conference feel at home in San Francisco. The drivers will display signs on their coat lapels and on their cabs setting forth which foreign language is spoken and understood, as well as the flag of that country.

The tabulation of languages and the number of Yellow Cab men who speak them includes the following:

Czech	2	Slavic	2
Danish	2	Spanish	22
French	12	Swedish	4
Italian	10	Swiss	2
Norwegian	2	Turkish	2
Portuguese	4	Greek	2
Russian	6	Persian	2
		Assyrian	2

*"Taxicab" in Spanish, Norwegian and Russian.

Air view of San Francisco Civic Center. (1) Civic Auditorium; (2) Health Center; (3) City Hall; (4) Opera House; (5) Veterans' Auditorium; (6) War and Treasury Building (with Federal Building beyond); (7) Public Library; (8) State Building; (9) Whitcomb Hotel. The Conference sessions are being held in (4) and (5).



OUR STOCK FOR TRADE

(Continued from page 277)

should consume black sheets, galvanized sheets, and hot rolled strips.

In the durable goods industry there are such items as kitchen stoves, water heaters, refrigerators, washing machines, floor furnaces, circulating heaters and central heating systems. In the general field of durable goods there seem to be endless opportunities, with well-established foundries, machine shops and metal finishing plants for production of kitchen gadgets and household articles, which can be exported. Cutlery, dental, drafting and surgical instruments are lines of a finer type that have definite possibilities.

In the broad field of machinery and equipment this area can definitely compete with the best. Agricultural machinery and equipment, canning machinery and road-building equipment are among the items that have definite export trade and increased opportunities. Also, a wide range of pumps and valves are manufactured here which have good foreign sales demand.

The diesel engine and gas combustion industries were given an increased impetus by the innumerable war needs, so that the marine and industrial types, as well as the stationary and portable engines, offer assured products for foreign distribution.

The entire field related to the automotive industry should be considered alone because of the great future of this industry abroad. Many firms have doubled and quadrupled their production during the war. Located in Metropolitan Oakland we have the manufacture of tires, rubber recapping materials, brake lining, bearings, gears, springs and rebuilt motors.

There are a number of very highly specialized industries in our area that have substantial overseas business. First among these is the calculating machine industry. The Metropolitan Oakland Area is one of the principal centers for this industry in the entire United States. Under the heading of electrical devices, controls, rectifiers, measuring meters, regulators and testing devices are lines that are an important contribution to our world business. Some of these items cannot be considered in the field of general export merchandising; yet within the limited fields they form very interesting trading items.

Certain kinds and grades of lumber and specialty wood products should be mentioned in any consideration of export business. Various mineral products and petroleum items are basic export items from this port.

So it goes, and where it ends nobody knows, for in any consideration of what can be exported, there is that unknown factor of merchandising and advertising that performs the supposedly impossible. We do ship "coal to Newcastle" and rice to China, candy to Denmark, oil burners to Brazil, calculators to Singapore, peanuts to the Philippines, dried fruit to Palestine, and diesel engines to South Africa.

Surely the future, with all the new developments yet to be revealed to us, will provide interesting experiences, new problems, stimulating opportunities, and further successes in this business of merchandising for a world market.

FOREIGN TRADE WEEK

(Continued from page 275)

farm population of 10,420,000 and a rural non-farm population of 9,544,000. These latter are very largely dependent on farm income. With 26 per cent of all farm produce exported, it is reasonable to assume that over 5 million of the above 20 million people are dependent on exports.

And there are city folks concerned with agriculture too. As an example, cotton is an agricultural product. There are 355,000 people engaged in cotton manufacturing, not including the finishing and dyeing business, or wholesaling and retailing. Nor should we overlook the 578,000 people engaged in apparel manufacturing. Nor those in the transportation, banking, and various other activities connected with the processing of products of the cotton industry which are covered by their own export statistics. The rural population has a real stake in foreign trade.

Cotton is mentioned above because it is our largest export item. In one recent year, 56 per cent of the cotton crop was exported, and the average percentage is somewhere between 40 and 50. Fifty per cent of the people engaged in growing cotton are wholly dependent on foreign trade.

But there are other products that carry large export percentages. Still in the South, 33 per cent of the tobacco crop goes abroad. In the West, 26 per cent of the raisins, 42 per cent of the prunes and 29 per cent of the sardines are shipped away. Also 32 per cent of the borax. In the North and East 36 per cent of the sewing machines and 23 per cent of the office appliances are fairly representative, as are aircraft and parts with 37 per cent, copper with 32 per cent, and lubricating oil with 29 per cent. Just give a thought to the number of people engaged in these and a thousand other industries. Then give another thought to the distribution of their earnings. Every dollar earned is either passed on to some merchant or put to work through investment channels.

The foreign trade dollar is a mighty dollar. It has had a large part in the prosperity of the country. Foreign Trade Week is supposed to offer opportunities for telling the general public of our dollar's importance. Let us also explore the possibilities for post-war expansion in our own fields.





Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

The Gyro-Compass

Part VI—The Gyro-Pilot

The gyro-pilot is an accessory to the gyro-compass in the same sense that the course recorder and the repeater compasses are accessories. Although it does require the supervision of an officer, just as ships still require crews, its functions are so important from the standpoint of economy and safety that a complete description of it will be given here.

As a result of the electrical repeater system, the true north indication of the gyro-compass is made available at any part of the ship by means of the positive operation of repeater motors. This availability of an unvarying reference led to its adaptation as a means of controlling the steering of the ship. As the wheelsman watches the lubber's line swing with the ship's head from side to side, he applies corrective rudder to maintain the lubber's line as closely as possible to the course he has been told to steer. The wheelsman in this case is a "human repeater," wherein he notices the position of the lubber's line and translates that knowledge into corrective action of the rudder. Thus, in order to substitute a mechanical apparatus for the human wheelsman, that apparatus must have a "brain" for detecting the swing of the lubber's line from the true gyro course, and it must also have "muscles" controlled by this "brain," which will apply corrective rudder movement.

The Sperry ship gyro-pilot is just such an instrument. A repeater motor, mounted inside the housing, positions a pair of contact rollers at all times according to the heading of the gyro-compass with respect to a reference point on the ship. This reference point in turn is adjusted by hand to correspond to the course it is desired to steer. As the ship swings to the right or left of this course, the contact rollers will move with respect to the reference point in the same manner as the lubber's line moves with respect to the compass card. This causes a contact to be made which will operate the "muscles" or steering gear control motor, which in turn causes corrective rudder to be applied. When the ship swings back toward the prescribed course, the amount of corrective rudder is diminished until the ship again is on her course, at which time the rudder is amidships. The diminishing of the rudder angle and final return to amidships is accomplished by an electrical "repeat-back" system.

In most large ships the steering wheel operates a hydraulic telemotor which opens or closes the valves of the steering engine to move the rudder one way or another, and the early types of gyro-pilot were almost always installed in the wheelhouse, where they operated the ship's steering wheel by means of a chain drive. While they were relatively inexpensive and more or less efficient, they had one serious drawback; their performance could be measured by the condition of the ship's hydraulic telemotor. If the telemotor leaked, or

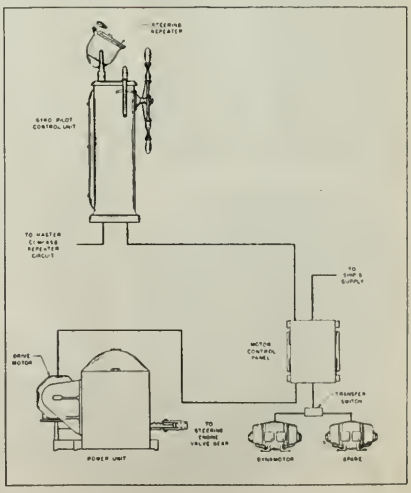


Fig. 24: Gyro-pilot arrangement.

if air was present in its system, its operation was uneven and a certain amount of lost motion was inevitable. Under these conditions the gyro-pilot was under the same disadvantage as the human helmsman. In order to overcome this disadvantage a new type of gyro-pilot was developed which, instead of operating through the ship's telemotor, operated through a complete electric telemotor system entirely independent of the ship's telemotor system. The gyro-pilot binnacle containing the control mechanism is placed in the wheelhouse as before, but the drive motor is placed in the steering engine room, where it operates the steering engine valves directly, thereby eliminating most of the lost motion which existed when operating through the ship's telemotor system. The control system of the gyro-pilot as now used will apply corrective rudder for one-sixth of a degree departure from the course.

Description of the Gyro-Pilot

The gyro-pilot equipment consists of a control unit, a power unit, a motor control panel and a dynamotor. The control unit contains the signal and control circuits for operating the power unit. The power unit contains the drive-motor and gearing necessary for moving the steering engine valve gear. The motor control panel contains the relays for amplifying the relatively small control currents into currents of sufficient strength to actuate the drive motor of the power unit. The dynamotor changes the ship's D-C supply into 115 volt, 60 cycle alternating current for operating the A-C relays and the self-synchronous repeat back system which cuts off the control signal. A typical set-up of this equipment is shown in Fig. 24.

The Control Unit

The control unit, or binnacle, of the gyro-pilot is mounted in the wheelhouse and contains the mechanism and the electrical circuits for controlling the rudder automatically through the gyro-compass repeater system, or manually by means of the pilot wheel. It also contains the weather and rudder adjustments for use with automatic steering. On the top of the control unit is a swivel yoke in which the steering repeater is supported. The complete control unit is shown in Fig. 25, the details of which follow. A schematic drawing showing the mechanism of the gyro-pilot is shown in Fig. 24.



Fig. 25: Gyro-pilot control unit.

Control Lever: The control lever on the side of the gyro-pilot binnacle enables the operator to select the form of steering he desires. This control lever has three positions: "Off," "Hand," and "Gyro." Moving the control lever to the "Off" position opens a control switch in the control unit binnacle, disengaging a magnetic clutch on the power unit and permitting the rudder to be controlled through the ship's hydraulic telemotor system by means of the telemotor wheel. Moving the control lever to the "Hand" position closes the control switch in the binnacle and engages the magnetic clutch on the power unit. Hand-electric, follow-up steering is now available under control of the pilot wheel. With the control lever in the "Gyro" position, the ship is kept on her course automatically under control of the gyro-compass.

Repeater Motor: The repeater motor within the control unit binnacle is connected to the master compass and drives the inner member, or trolley, of the contact ring assembly.

Contact Ring Assembly: The outer member of this assembly consists of two current-carrying rings concentrically mounted. Each ring is composed of two semicircular segments separated by air gaps. The inner member, or trolley, assembly consists of two energized rollers, one of which rests upon the outer concentric ring, the other upon the inner. Both of these rollers are connected to one side of the armature circuit of the servo motor. The electrical arrangement is such that when the circuit is completed through the outer ring the servo motor is driven in one direction; when the circuit is completed through the inner ring it is driven in the opposite direction.

Servo Motor: The servo motor is geared to the contact rings so that the rotation of the motor causes the rings to follow the movement of the trolleys and stop the motor. The servo motor also drives, through a differential gear, the control ring assembly which actuates the power unit drive-motor.

Control Ring Assembly: This assembly is similar in construction to the contact ring assembly, but its trolleys normally rest upon the dead segments of the concentric rings instead of the live segments. The concentric rings are driven either by the servo motor or by the pilot wheel (depending upon the position of the control lever), and an electrical circuit is completed through the current-carrying segments and the trolleys to operate the A-C relays on the motor control panel. These relays in turn operate the clapper switches which control the drive-motor. Follow-up control is obtained through the trolleys in the control ring assembly, which are geared to the self-synchronous receiver.

Pilot Wheel: The pilot wheel operates the outer member of the control ring assembly through a differential gear. This gear also serves to prevent the servo motor from revolving during pilot wheel steering. A friction brake on the pilot wheel shaft prevents the pilot wheel from turning during automatic steering.

Position Indicator: The steering wheel position indicator on the top of the gyro-pilot binnacle is geared to the contact rings of the control ring assembly. Its pointer moves over a graduated dial which is illuminated at night by means of a dimmer light mounted on the bin-

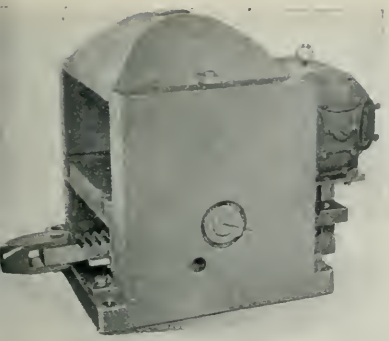


Fig. 26: The power unit.

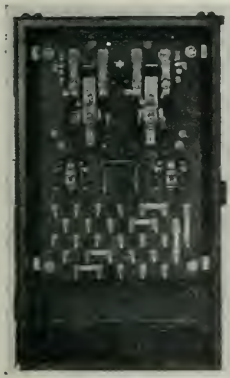


Fig. 27: The motor control panel.

nacle. The position of the pointer indicates to the wheelsman the position of the pilot wheel relative to the amidship position.

The Power Unit: This unit contains the necessary equipment to operate the steering engine valve. This is accomplished by the drive motor through the magnetic clutch and gear train. It also contains the rudder limit switch and the self-synchronous transmitter which is a part of the follow-up system. It is illustrated in Fig. 26.

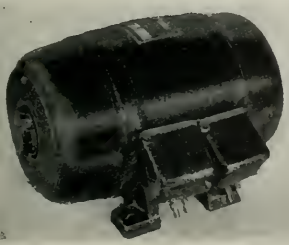
The Motor Control Panel: This unit, shown in Fig. 27, contains the electrical circuits and the switches necessary to control the drive motor in the power unit.

The Dynamotor: This machine converts the ship's D-C supply into 110 volt, 60 cycle alternating current for operating the self-synchronous repeat-back system and the pilot relays. It is shown in Fig. 28.

(To be continued)

(All diagrams courtesy of Sperry Gyroscope Company, Brooklyn, N. Y.)

Fig. 28: The dynamotor.



Question and Answer Dept.

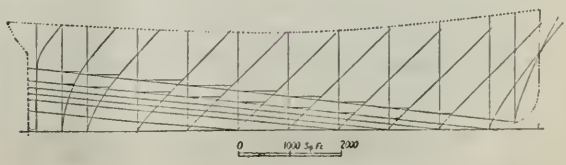
Question — Dear Skipper: Will you, in your "Answers to Questions Department," please explain the construction and use in ship design of Bonjean Curves?

— J.A.W., San Pedro, Calif.

Answer—Bonjean curves are curves of areas of transverse sections. These curves are drawn at each section or station on the outline profile of the ship as shown herewith. The areas of all sections in the body plan, starting from the keel upwards, are calculated waterline by waterline, or determined more quickly by means of the planimeter and set off horizontally to scale from each section line in the profile. The lines drawn through these points are known as Bonjean curves. Any waterline drawn perpendicularly from any section line in the profile represents the measure of the area of the transverse section up to that draught. These curves are nearly straight lines except at the extreme ends of the vessel and are very easily constructed.

When the ship is floating at the normal designed trim, the ordinary calculation for displacement and center of buoyancy for the series of waterlines parallel to the keel is a comparatively simple matter. However, when the angle of trim is large, as in the case of launching, or when an end compartment is flooded, or when the ship is on a wave, the use of the Bonjean curves greatly facilitates the calculations. When the new displacement at a certain angle of trim is desired, a line is drawn in the profile, representing that trim. The new sectional areas may now be read off by simply scaling the lines drawn perpendicular from the respective station lines to where they cross the curves. By tabulating these new areas and completing the usual calculation, using Simpson's rule and the levers, the desired new displacement and the longitudinal center of buoyancy are found.

It is very apparent from the above that Bonjean curves are very useful in making calculations in trim, launching floodable lengths and subdivision of ships where new displacements and centers of buoyancy and gravity must be found.





Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Brushes and Commutation

(Continued)

In the last article it was concluded that many if not most of the troubles of d. c. machines manifest themselves in some kind of indication at the brushes and commutator.

We now discuss some of the **disturbing factors.**

There are several atmospheric conditions which upset good commutation. In other words, commutation may be excellent at one time, then with a change in surrounding atmospheric conditions, commutation will be poor, and again it will correct itself on the restoration of normal surrounding conditions.

These atmospheric contaminations are called **atmospheric poisons** or **contact poisons.** These may be a determining factor in selecting a grade of brush.

Materials having a deoxidizing effect disturb the oxide film on the commutator, changing and increasing brush friction, brush and copper wear.

Sulphur in the slightest trace, not noticeable to the nose, tends to develop a dark glossy surface on the commutator. Should this film build up too thick, the contact drop increases, the film punctures through in spots, and streaking or threading results. Oil of almost any kind shows a similar result at perhaps a different color. Sparking underneath the brush may occur when the voltage drop across the contact path exceeds three volts, as read on a volt meter with one terminal connected to the brush pig-tail and one to a pencil sliding on the commutator near the end but in line with the brush.

On the other hand a contact drop of about one volt is needed properly to limit the short circuit current in the coil whose terminals are connected to the two adjacent commutator bars simultaneously in contact with the brush. Other contact poisons are: oily atmospheres; ammonia fumes (ever a slight trace); steam vapors; and petroleum gases. Any abnormal atmosphere changes the film, but not always to make poor commutation.

This destructive sparking underneath the brush, not visible at the trailing edge, may also be caused by: faulty inter-pole adjustment; contact over less than the full width of the commutator bar; too thin brushes; or other conditions in the coil undergoing commutation that tend to shorten the commutating time interval and compel over-rapid change of current. It is to be noted that while bars connected to the coil terminals are in contact with one brush, the full coil current is reversed from one direction to the other.

In the presence of a high resistance (contact drop, over three volts) glaze or film, such under-surface sparking punctures this film and is one cause of the small spots of bare copper sometimes seen on an otherwise uniformly glossy commutator surface. This localized breakdown of film releases particles of copper which may become imbedded in the brush face and cause streaking of the surface. This copper then may carry high localized current causing arcing and eventually grooving of the commutator.

Also, humidity has been found to have an effect on metal-graphite slip-ring brushes. During periods of low humidity excessive dusting and

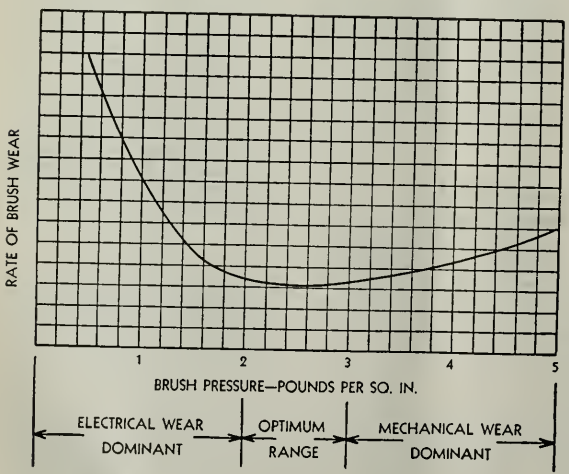


FIGURE 3
RELATIONSHIP OF BRUSH PRESSURE AND RATE OF BRUSH WEAR FOR LAMPBLACK BASE, ELECTROGRAPHITIC GRADES

rapid wear of these brushes takes place. The effect of humidity on commutator brushes is less marked, but some undesirable effects may result from very high humidity. Humidity probably has a favorable effect on friction as long as an unbroken film exists. However, excessive moisture in the air may be a source of electrolytic action under the brush face, causing deposition of copper on the faces of the positive brushes, on generators, or the negative brushes on motors. If this effect is pronounced, the imbedded copper may break up the commutator film, impair commutation, and in severe cases cause threading or grooving.

Temperature also has a pronounced influence on performance, but probably the most important effects are transient in character. That is, they are related to the highly localized temperature conditions momentarily established at the points through which current passes between brush and copper bar. As indicated in the last article, these localized points of current transfer are of three types: (1) solid contact between carbon brush and commutator surface; (2) contacts established by bridging particles of conducting material; (3) points at which current passes in the form of minute arcs. Very high local temperatures exist at the points where arcing transfer occurs, somewhat lower temperature at the points of particle contact, and still lower temperatures at the points of solid contact. Even at these latter points the temperatures may be very much higher than the average brush temperature, or surface temperature. It seems probable that these temperatures may at times be high enough to cause ionization, or gassing of some of the adjacent materials or change in the chemical nature of the materials, all of which affect commutation by changing contact resistance. The average temperature of the commutator and brushes has little effect other than to cause loosening of bars or excessive oxidation, since most chemical reactions go forward at an accelerated rate at elevated temperatures.

Local difference in temperature of the copper bars causes the hottest ones to protrude above the general surface. Passing current through an armature while standing still would heat individual bars and cause sparking, when running, until the temperatures are equalized.

Brush friction may be a disturbing factor, as it affects performance by heat liberation, chattering of the brushes, and the stability with which they ride in the brush holder.

The interlocking of microscopic irregularities is probably the main source of friction. The magnitude will depend on the ease with which these interfering points break away or ride over each other. Abrasion from firmly imbedded particles increases friction, and most brushes having abrasive or polishing action show a higher coefficient of friction. Brushes hard to the touch are not necessarily hard or abrasive; quite the contrary is usually true. However, brushes with a soft, slick feel may have the lowest friction and highest abrasive character.

Natural graphite feels smooth, soft and slick, but contains some gritty material or volcanic ash which cannot be removed in the usual refining process. This gritty material is a source of abrasion, in spite of the smooth lubricated feel and action of the graphite. Electro-graphitic brushes are made from a graphite formed under controlled conditions and can be free of abrasive particles. Graphite in general is an excellent dry lubricant.

It seems probable that the best combination for brush material is carbon obtained from lamp black mixed with electro-graphite as a lubricant. Other materials may be added.

Brush pressure is the force in pounds pressing the brush down to the commutator divided by the cross sectional area of the brush. It should be equal on all brushes to prevent unequal or selective current collection. There is a limited range of pressure within which best brush performance is obtained. If the pressure is too light, imperfect contact with the commutator is obtained. This is a frequent source of sparking and undue wear of brush and injury to the commutator. Excessive pressure results in unnecessary friction, heating wear, and perhaps instability of the brush in the holder. However, there is a reasonably wide latitude of pressure within which performance can be expected. The limits of this range vary with different types of brush, and the application and manufacturer's recommendations should be carefully considered. Strong vibration, such as on motors driving hoists, may need higher brush pressure. Also higher commutator speed will need more pressure to maintain a continuous contact.

Brush wear is not necessarily reduced by reduced pressure. In fact, at too low pressure operation, wear increases from arcing. Electrical causes of wear predominate at low pressures. Increased wear from mechanical friction occurs at pressures over the limiting values.

This relationship between brush wear and brush pressure is indicated approximately in the accompanying chart. Note that the usual optimum or best pressure is around two to three pounds. For traction motors or other high level vibration, the pressures may run up to six pounds. (This chart is taken from "Modern Pyramids," published by the National Carbon Co.)

Moore Launches Last Ship

The last vessel in the Moore Dry Dock Company's World War II shipbuilding program was launched on April 24. The firm is gearing its facilities for conversion to 100 per cent repair work, after outfitting is completed on the 12 remaining vessels.

The last launching was of the C-2 cargo ship SS Carrier Pigeon, christened by Mrs. Ingrid Christensen, wife of Lars Christensen, Norwegian consul in New York.

Another milestone reached at the same time was the completion of the 2000th ship to be repaired by the Moore yards since Pearl Harbor. Company officials declared that this meant an average of one ship repaired and returned to service every 14 hours and 48 minutes, night and day, since Pearl Harbor. Moore workers have done repair jobs on ships ranging in size from the giant aircraft carrier Ranger to invasion craft as small as the Navy's Landing Ships, Medium, known as "Pacific Puddle Jumpers."

The 2000th ship to be repaired was a freighter, docked for "voyage repairs" of parts damaged or worn out in the ordinary course of sea travel. The dozens of jobs on the 2000th work list included everything from repairing the ship's coffeemaker to dismantling a bearing on a turbine generator for cleaning and testing.

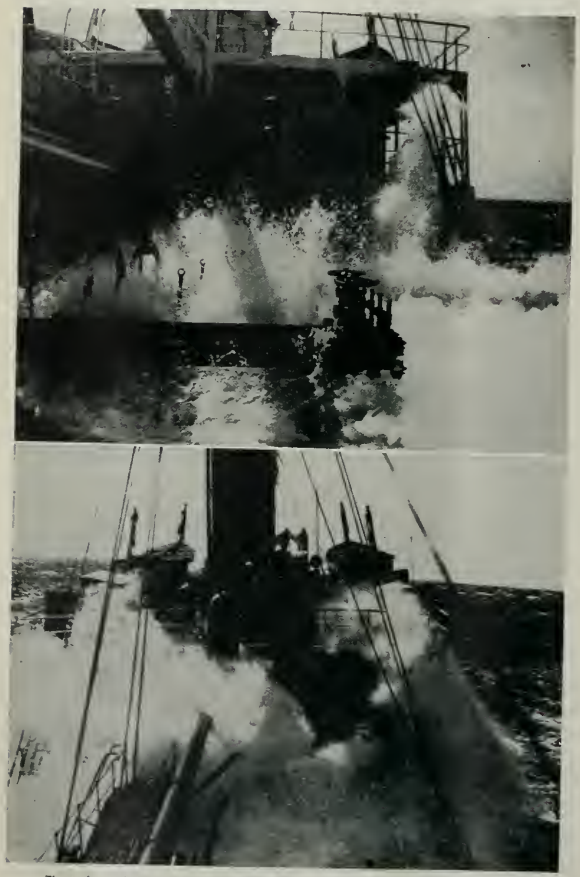
The yards, equipped with five drydocks and three marine railways, are expected to be engaged in repair and conversion work until well after the end of hostilities.

In the meantime, structural steel and industrial machinery divisions will be expanded as the basis for continuation of the company's activities into the peacetime era.

Pressure-Vacuum Vent Valves

The Importance of Their Efficiency On Oil Tankers

By M. M. Drake



These views of a comparatively calm sea breaking over the waist of a tanker illustrate the beating to which tanker deck fittings are subject.

Under the Tanker Rules of the U. S. Coast Guard Merchant Marine Inspection, all tankers used in the transportation of gasoline are required to be fitted with pressure-vacuum relief valves on the tank vents. This requirement is made primarily to exclude the weather and as well to prevent the spread of fire to the highly inflammable and often explosive contents of the cargo tanks. They are also required to prevent the development of excessive pressure or vacuum in the tanks, which might disrupt the ship's structure.

There is another very important function, however, which these vent valves may perform, that of the maintenance of pressure on the free surface of the liquid cargo to reduce evaporation losses. This latter function is only made possible by the use of valves, designed to remain tight under all conditions of weather, especially on a rolling ship. Unfortunately, too little consideration is given to the possibilities for economy in the latter function, and, as a result, millions of gallons of precious gasoline are being lost yearly through evaporation while in transit. This condition has existed not only through the use of improperly designed vent valves but often through the improper use and maintenance of well-designed valves.

The tremendous development in the use of airplanes during the last few years has greatly increased the production of high-test gasoline, a large proportion of which has to be transported overseas to our war fronts. There is also a heavy movement of high-test gasoline on the inland waterways of the United States.

In this transportation, the tankers for weeks at a time are subjected to

(The author is manager of Mechanical Marine Company, New York, N. Y.)

sharp temperature rises, such as to cause rapid evaporation of the highly volatile cargo, unless a pressure is maintained on the free surfaces in the tanks. In this evaporation it is the "light-ends" which pass off first, so the fuel thus loses the very elements which give it the extra pep so essential for the highest efficiency of the airplanes and other motor-driven equipment now being used in our war effort.

The proper maintenance of the vent valves on a tanker is of much importance to insure that they are kept in efficient working condition. For that reason it is essential that the design of the valves be such as to provide for ease of disassembly, cleaning and reassembling; also that the moving parts be as few as possible, and of such design that they may be replaced in proper order with a minimum of time and effort.

The vent valves on a tanker, especially those on a seagoing ship, are subject to rigorous service, being exposed to mechanical injury and the corrosive influences of salt water, the slight acidity of gasoline, and hot steam. Hence they should be of rugged construction and made of materials which combine strength with resistance to these corrosive influences. They should also be made of one kind of metal only to avoid electrolytic action. Bronze has been found to be the most satisfactory metal for this service, as it combines strength and resistance to corrosion, and (having a melting point of about 1700 deg. F.) is well resistant to fire.

The vent valves originally used on oil tankers were spring loaded. After a short period of service these were found to be very unreliable and to require entirely too much attention and expense to maintain them in proper working condition. Much trouble was experienced from broken springs and sticking valves. Weight-loaded valves were developed for this service in 1926, and, having proved very satisfactory, are now almost universally used. Weight-loaded vent valves require a minimum of attention, and if properly designed and maintained will outlast the life of a tanker.

In order to reduce manufacturing costs, lead, in some instances, has been used to load vent valves. This practice is somewhat questionable, and is in disfavor among the experts of the discriminating oil companies. Lead melts at about 610 deg. F., a temperature soon reached on a ship afire. The use of lead weights in a vent valve would greatly reduce the usefulness of the valve to prevent the spread of fire. Lead has also been found to deteriorate quite rapidly around salt water. Its being soft also makes that metal quite susceptible to damage in handling and liable to change shape easily.

In marine practice, the design of the poppets in a weight-loaded vent valve is of great importance, especially on a seagoing tanker. These ships while at sea are subject to almost continual motion from wave action, often somewhat violent. Poppets to remain tight under such conditions must be well balanced and guided, and preferably in one piece. As little metal as practicable should be in contact between the poppets and the guides. More positive alignment is assured by having the guides integral with the body casting, which carries the valve seat. This arrangement also permits closer tolerance between the poppets and guides, insuring a tighter valve. Seats should be of the bevel type, that type being the tightest known to valve engineers in the world today. It also has been found to be a distinct advantage to have a poppet guided both above and below its seat, giving it a certain amount of balance. Poppets of the above description are very simple and provide for ease of maintenance.

In the closed vent systems now used on practically all tankers fitted for the transportation of Grade A cargoes, the vent units are inserted in a vent gathering line, but often rigidly supported by some part of the ship's structure. Under service conditions the units are subjected to all manner of strains due to the working of the ship, expansion and contraction caused by temperature changes, as well as strain due to careless pipe fitting. The importance of tight valves on a Grade A tanker is much greater, that type of ship being generally used for the transportation of the cargoes of higher volatility. To maintain tight valves in an enclosed type vent unit it is essential, especially with the larger multi-valve units, that the body casting be of a design which will not be distorted by the strains to which it may be subjected.

Nearly all vent valves used on tankers are fitted with flame screens or arresters as extra precaution. The poppets themselves, in a vent valve, are sufficient flame arresters. When pressure or vacuum causes them to raise, the lift is slight, forcing the gas through the valve at such a velocity that flame cannot flash back through the valve against the stream of gas.

Various metals are used for flame screens, but it has been found that in marine service screens of Monel metal stand up much longer. Screens of brass and copper are also used, but they clog up much more quickly. Screens of 40 x 40 mesh, made of wire 0.010 in. diameter, have high efficiency as flame arresters and are in common use. However, they are very light and therefore delicate, and it has been found that on the larger size vent units, a mesh of 30 x 30 with 0.014 in. diameter wire is much more satisfactory. That mesh is practically the equal of the 40 x 40 as a flame arrester and is so much stronger that it better withstands the rough treatment of cleaning. The 30 x 30 mesh made of 0.014 in. diameter has less net area through it than the 40 x 40 mesh with 0.010 in. diameter wire.

Flame screens should have a net area in excess of the pipe size area and should be covered by a substantial but easily removable guard for protection against mechanical injury and careless painting. Flame screens should always be fitted in a vertical position. A large percentage of the foreign matter caught by a vertical flame screen will drop to the bottom, thus prolonging the period of its clear area. Foreign matter caught on a horizontal screen will lie there until removed.

Flame screens when fitted to the vent unit should be mounted on a grid or cage having ribs dividing it into small panels. This arrangement not only provides support for the comparatively weak mesh but increases its efficiency as a flame arrester.

The above observations are inspired by many years of experience in the venting of tankers of all description. Many of the features pointed out have developed from suggestions made by the marine departments and safety committees of the leading oil companies. Some operators seem to feel that vent valves are fitted on their tank vessels merely to comply with the rules. However, it seems quite apparent that the use of efficient vent valves will not only afford protection to a tanker but pay dividends in the reduction of evaporation losses.



Joiner crew installing Fiberglas insulation in a merchant ship.

514-Ship Armada Outfitted

Fitting Fiberglas insulation into tough spots is just part of the day's work for members of the joiner crew.



More than three years ago, on September 27, 1941, the S. S. Star of Oregon slid down the ways at Portland's Oregon Shipyard. It was the first Liberty ship launched at Portland, and the joinery work represented the initial venture of a company new in the field.

Before the United States embarked upon its great shipbuilding program to meet the Axis menace, George H. Buckler, head of Buckler Company and Buckler-Chapman, was a contractor well known throughout the Northwest for his handling of big-time contracting jobs. Among these have been the barracks and dormitories at Bonneville, the housing and facilities at Vanport City, the Port of Vancouver Terminal Number 2, the Portland Tuberculosis Hospital, and the Port of Portland Terminal Number 1.

Ship joinery, however, represented a venture into unfamiliar territory. It called for a revamped organization and new techniques. The record made by Buckler Company and Buckler-Chapman in this new field is an outstanding example of the adaptability shown by American industry in meeting the demands of war. Since the launching of the Star of Oregon, ship joiner Buckler's twin companies have outfitted 514 ships, nine per cent of all the ships delivered to the U. S. Maritime Commission during the war period.

On all of these vessels, Buckler workers have installed furniture, lockers, berths, cargo battens, hatch covers, gun mounts, bulkhead and ceiling panels, insulation, and a multitude of other equipment. Insulation, unknown to ship joiners in the days of sailing ships, when crew and passengers lived largely on hardtack and salt pork, now is required in engine rooms, magazines, living quarters, galleys, dry stores, gyro rooms and refrigerated spaces. Its installation has become a major part of the ship joiner's job.

In 61 AP-5 Attack Transports outfitted by Buckler workers, nearly 10,000,000 square feet of Fiberglas insulation was installed. About 6,000,000 board feet of Fiberglas insulation was installed by the Bucklerites in 50 CVE's. Over 20,000 square feet of Fiberglas has gone into each of 32 Buckler-outfitted Victory ships, and about 6000 square feet in each of 332 Liberty ships. Additional thousands of feet of Fiberglas have

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Owesen and Company In New Quarters

Owesen and Company, wholesale distributors of marine and electrical equipment, recently removed to new and more commodious quarters located in the Owesen Building at 105 Front Street, San Francisco. These new facilities enable them to carry an extensive and complete line of merchandise in the marine trade, and with their additional personnel they are now in a position to give improved service to their many customers in the United States and foreign shipping trade.

Originally established in 1912, the company still continues to represent many of the better-known United States manufacturers which it represented at that time, and is also the exclusive distributor for several of the large Eastern electrical manufacturing companies in the marine field, selling extensively to all the ship chandlers on the Pacific Coast.

A. B. Owesen is the founder and owner; Col. Oliver Vickery, the sales-manager; and Capt. H. J. Andreassen, general manager of the San Francisco area. Otto Dedrick is the San Pedro manager.

At the company's branch in San Francisco they maintain a complete electrical shop staffed by trained technicians capable of handling all kinds of marine electrical installations, including winches. They also operate a special department devoted entirely to seagoing safety equipment which contains a wide selection of life-saving suits, jackets and other apparatus.

Owesen and Company are specialists in all their lines and are well equipped to ship to any part of the world where the U.S.A. and the Allies operate ships. The headquarters office is located in San Pedro, and another branch is at 15 Whitehall Street, New York City.









Top to bottom: A. B. Owesen, Col. Oliver Vickery and Capt. H. J. Andreassen.

Keep Posted

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Electric Stud Welding

In answer to the widespread demand for improved welding products and improved stud welding techniques, a new company has been formed within the past few months. This company is the Electric Stud Company, with home offices at Los Angeles, California.

During the relatively short life of this new corporation, a considerable volume of business has been with the shipyards, naval bases and general industrial concerns.





Roland T. Kinney, president (top), and Wendell H. Kinney, vice president, Electric Stud Company.

The company manufactures a new type of flux-sprayed stud, which it is claimed gives more uniform thermo-conductivity at the point of weld. A new type of ferrule has been perfected which gives many advantages over the standard type of ferrule that has been in general use previously. This ferrule was first developed and used in the automotive and trailer field. Its general advantages have been modified and adapted for current usage. One of its most important principles is a new type of heavy bodied clay which absorbs the gaseous product of the heat contact rather than reflecting it into the weld as in the past. This absorbent quality prevents the formation of a porous condition in the structure of the weld.

In addition, the fit of the ferrule around the body of the stud is such as to permit more even disposal of surplus heat. Considerable research has been undertaken with a view toward the development of patented accessories for which current usage in the various shipyards has built up a demand. A new stud welding gun has been developed and patented which will shortly be presented to the trade. The primary object of the company as announced is to supply any equipment which will perfect or improve stud welding techniques.

Several new devices, which are at present being tested in the field, will be announced as soon as patent applications are completed.

The new company has established a consulting service which has been utilized profitably by many concerns. Technicians have saved many welding man-hours on various jobs by changing and perfecting stud welding techniques. This consulting service is available to any company at any time.

Consulting engineers of the company were quoted as saying that the potentialities of stud welding are still in the primary stages of development. Many companies, they say, who are using stud welding in certain stages of their manufacturing processes fail to realize that thousands of additional man-hours could be saved by applying the stud welding to other portions of their manufacturing processes and by a study and analysis of their stud welding procedure. In addition, these engineers claim, the miracles of wartime production will be transported into many other industrial fields of civilian activity hitherto untouched.

It is the intention of the company to intensify its program and to make available its experience to manufacturers in the fields who have not heretofore used stud welding.

The consulting service, price lists and descriptive material are available at the home office of the Los Angeles concern to anyone who desires them.

The company is one of the Kinney Industries of Los Angeles. This group of companies is owned and controlled by Wendell H. Kinney and Roland T. Kinney, and consists of Kinney Iron Works, Kinney Aluminum Company, The Kinney Company, Standard Steel Corporation, Kinney Engineering Company, National Armament Company, and several other companies engaged in general manufacturing. The general manager of Electric Stud Company is W. Harry Johnston, the chief engineer is Glenn Whitmore, and B. R. Ells heads the Research and Development Department; all are well known in welding circles.

Unique Metallic Packing

When Rodpak Manufacturing Co., San Francisco, first offered its unusual, patented metallic packing eight years ago, its owners were confident of its merit and durability. So Roy Hamilton and Edward Rothchild gave a one-year guarantee with every set of their Rodpak metallic packing. In the years since, the serviceability of their packing has been thoroughly tested in many types of installations and under a great variety of conditions. The average service

life of Rodpak has proved to be not merely one year, but nearly four years!

Marine engineers, faced with frequent extensive, costly repacking jobs, welcome Rodpak's long life and consequent economy.

They welcome also the speedy delivery service, which is fast despite the fact that all these packings are made to order to meet individual specifications.

Another welcome feature is the ease and speed with which this unusual packing can be installed, and which results in minimizing idle time of pumps and other equipment during installation of the packing.

Rodpak metallic packing accomplishes these things because of its patented construction. A series of metal and synthetic rubber rings alternate in this unique packing, which is extensively used in many floating units of our Armed Forces and in maritime vessels.

Power Grease Gun

A new Alemite electric portable power grease gun, Model 7190, the latest addition to the Alemite line of industrial equipment, is announced by the industrial Alemite division, Stewart-Warner Corporation.

The new gun has been developed to deliver fast, positive high pressure lubrication with all types of lubricants that seek their own level. Equipped with large heavy duty wheels for easy mobility, operation is further facilitated by means of a ball bearing front caster in the steering mechanism.

A quiet driving device connects the heavy duty 1/3 horsepower electric motor to a high pressure grease piston and cylinder, made of specially treated and hardened steel, and fitted to close limits to prevent by-passing. A mercury switch automatically shuts off the motor when 5000 pounds of pressure have been built up in the delivery hose.

The gun has an easily accessible check valve and pressure release valve. Equipment includes a 12-foot electric cord, a 6-foot, one-quarter inch, 20,000-pound burst pressure hose and control valve with hydraulic coupling, combination handle, cord and hose rack. The gun stands 8½ inches high, 15 inches wide and 6 inches long.



Plastic Application

Black Tenite plastic replaces nickel-plated brass for rim, mouthpiece, and handle of this Navy megaphone. Rim stock is cantinuously extruded, called by the extruder for storage and shipment, and cut to the desired length by the manufacturer of the megaphone. The rim is extruded in a V-shaped profile into which the paper of the megaphone fits and is fastened with cement, and the two ends of the rim are joined by an acetone solution in a band as permanent as the material itself. Tenite trim such as this requires no further finishing and comes from the extrusion machine with a high, permanent luster. Tenite is a product of Tennessee Eastman Corporation, Kingsport, Tenn.

Vac-Rel Vent Valves

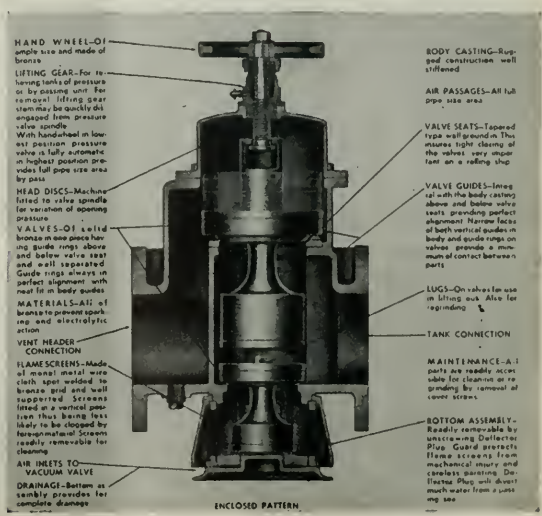
The Mechanical Marine Co. of 17 Battery Place, New York, N. Y., are the originators and producers of the Vac-Rel weight-loaded pressure-vacuum relief valves shown in the illustration. Their conception of these vent units arose from their years of experience in marine oil transportation. They have benefited from direct contact with the problems of water transportation of petroleum products, and have had much valuable advice from the marine departments of the large oil companies in the development of these vent units.

Reference to the illustration will show that the units have all the characteristics of well-designed valves for that service. They are made to suit all types of marine service and sizes of tankers. The enclosed pattern units are made in single, duplex or triplex models to suit the type of tankship.

Vac-Rel vent units have gone through several bad fires, in which they performed with credit, and assisted greatly in saving the ship as well as a large portion of the cargo. In the latest case, that of a large seagoing tanker loaded with high-octane gasoline, set afire through collision, the vent system worked perfectly. Even after being subjected to the intense heat of the fire, the vent valves on the ship were apparently, for the most part, still in workable condition.

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Vac-Rel pressure vacuum valve.



On the Ways—

SHIPS IN THE MAKING



LARGEST STRUCTURE EVER TOWED UP WILLAMETTE

The center section of a new drydock built at Vancouver, Wash., on its way to join the fore and aft sections at Swan Island, Portland, Oregon. Now completed, the dock has been permanently installed at Swan Island. Four tugs were required to aid the center section to make the 13 mile journey. The stern wheeler Henderson in foreground, owned and operated by Shaver Transportation Co., is operating its paddles in reverse.

Ingalls Launches SS Marguerite A. Le Hand

The SS Marguerite A. Le Hand, named in honor of President Roosevelt's secretary, the famous "Missey" who passed away last year, was launched on March 28 from the Ingalls yard at Pascagoula, Miss. Mrs. Thomas E. Collins was the sponsor.



Destroyer USS Henley slides down the ways at Bethlehem Steel Company's San Francisco shipyard ways on April 8, 1945.

All-Welded Tanker In Invasion

The all-welded tanker, Transoil, which was constructed at Mobile, Alabama, in 1936 by the Ingalls Shipbuilding Corporation, took an important and dangerous part in the Normandy invasion. The service of the Transoil and 43 other coastal ships was hazardous because they were among the first vessels to touch the invasion beaches. With a gross tonnage of 1571 and a draft of 16½ feet, the tanker was especially suited for the front-line service in transporting oil, life blood of mechanized warfare, across the English Channel.

Before the invasion these coastal ships made the Atlantic crossing with ease and were of particular value in supplying small ports in the British Isles and in reshipping cargo and munitions brought across by larger vessels.

MS Transoil, 258' tanker built for American Tankers Corp. by Ingalls Iron Works in 1936. She is an all-welded tanker.











Above left: Little Patricia McCaffery christening the destroyer while E. C. Rechtin, gen. mgr. of San Pedro yard supervises the christening. At right: Huge and powerful destroyer, USS McCaffery, before the launching on April 12.

Destroyer at San Pedro

Sponsored by Miss Patricia McCaffery, nine-year-old niece of the Marine officer after whom it was named, the USS McCaffery was launched April 12, at the Bethlehem Steel Company, San Pedro. The new 2200-ton destroyer, one of the longest destroyers built on the Pacific Coast is named for Lt. Col. Joseph Patrick McCaffery, USMC, who was killed on Bougainville.

At the time of his death he held the Purple Heart for wounds received in battle, Silver Star Medal for gallantry as commanding officer of a battalion on Guadalcanal, Presidential Unit Citation as part of the First Marine Division, Reinforced, and the Navy Cross for extraordinary heroism while in command of a Marine Raider Battalion in action against Japanese forces during the landing on Bougainville.

The matron of honor was the sponsor's mother, widow of Lt. Col. J. P. McCaffery's brother, Col. Hugh F. McCaffery, USMC.



At top right: Mrs. Nicholas D. Cresci, wife of a Marinship shipfitter, smashes the bottle against the bow of the SS Kern Hills, as her party cheers. Below: The SS Kern Hills following the launching lies on the waters of San Francisco Bay.



At right: An unusual photograph of a new super destroyer, USS Harlon R. Dickson, going to town (with New York City in background) from U.S. Steel's Federal shipyard, where she was built. Lower right: "Assault commander's dreamboat" is a Navy idiom for this newest type amphibious warship, the LSM-258. She is a product of Federal shipyard.

Contracts for Commercial Iron

New contracts for completion of several vessels have recently been announced by Commercial Iron Works of Portland, Oregon. One of the ships is to be a carrier of the CVE 105 class, making a total of three such hulls to be completed by the firm. The other contract calls for the completion of five 180-foot bare mine sweeper hulls now at another Portland yard. It is expected that work on the carriers will extend the present load into January, 1946.







Top, left: Sea trial of the K-205, the Painsett, ocean-going cargo vessel built by U. S. Maritime Commission in Leathem D. Smith shipyard, Sturgeon Bay, Wisconsin.

Center: The Caseys went to bat at Kaiser Vancouver Yards, April 4. Mrs. Winston Casey swinging a perfect hit with the champagne on the bow of C-4 troopship, Marine Shark. Husband, president at Commercial Iron Works, had launching "jitters." Mr. Casey shows Mrs. Casey how not to strike out.

Lower left: Side launching of DD-880, USS Dyess, a destroyer, at the Orange, Texas yard of Consolidated Steel Corporation.

Photograph by Dan Smith. Released by District P. L. Officer, U. S. Navy.

New Union Oil Tonker Launched

More than the usual significance was attached to the launching of the tanker for Union Oil Company, the Santa Paula, on April 7, at the Sun Shipbuilding & Dry Dock Company, since Union had its origin in the City of Santa Paula some 55 years ago and gained its first success in the oil fields in that locality.

Union Oil Company was founded in 1890 by Lyman Stewart in association with nine other Santa Paula businessmen. Mrs. William Lyman Stewart, Jr., wife of the grandson of Stewart, sponsored the tanker.

The new tanker was building for the U. S. Maritime Commission prior to its sale to Union for an estimated consideration of $2,800,000.

The Santa Paula is of the latest T2-SE-1A type with a capacity of 141,000 barrels and a speed of 14½ knots. By comparison, the older vessels traded on the transaction had a combined capacity of 229,516 barrels with speeds of 10.3 knots. The Deroche, the oldest of the group of company tankers, was built in 1919, followed by the Cathwood in 1920 and the La Placentia in 1921. As part payment for the new tanker Union has turned in the above three older tankers.

Commissioning of Bristol at Bethlehem—San Pedro

Another powerful 2200-ton destroyer was added to the fleet when the USS Bristol was placed in Commission March 31, at the Bethlehem Shipbuilding Yard, San Pedro.

Commander Kenneth P. Letts, USN, accepted the ship as its first commanding officer.

Commander Kenneth P. Letts, USN, reading his orders at Commissioning of USS Bristol.





At the launching of the SS Santa Paula at Sun shipyards are William Lyman Stewart, Mrs. Stewart, sponsor, and John G. Pew, president, Sun Shipbuilding and Dry Dock Co.

(See story on opposite page.)

Production Total for March

A total of 126 vessels of 1,294,432 deadweight tons were added to the Allies' striking power when delivered by merchant shipyards during March, the Maritime Commission announced.

This brings the total production for the first quarter of the year to 371 vessels aggregating 3,824,068 dw tons. Of those built during March, 95 were dry cargo vessels, 18 tankers and 13 military types. One minor type, a concrete barge of 433 dw tons, was delivered on the West Coast and not included in the total.

West Coast shipyards led other regions in building 58 of the month's completed ships, aggregating 611,138 dw tons or 47.2 per cent of the total production.

Ships delivered from U. S. Maritime Commission yards during March follow:

Yard	Number	Type
Alabama Shipbuilding Co.	3	T2 Tankers
Avondale Marine, Westwego, La.	1	Coastal Cargo
Bethlehem-Fairfield, Baltimore, Md.	9	Victory Cargo
Bethlehem-Sparrows Point, Md.	1	T3 Tanker
Calship, Wilmington, Calif.	9	Victory Cargo
Consolidated Steel Corp., Wilmington, Calif.	4	Military Type
Consolidated Steel Corp., Long Beach, Calif.	3	Coastal Cargo
Delta, New Orleans, La.	3	Liberty Cargo
East Coast, Bayonne, N. J.	1	Naval Tanker (Coastal)
Federal, Kearny, N. J.	2	Military Type
Froemming Bros., Milwaukee, Wis.	1	Coastal Cargo
Gulf, Mobile, Ala.	1	C2 Cargo
Ingalls, Pascagoula, Miss.	2	Military Type
	2	C3 Cargo
J. A. Jones, Brunswick, Ga.	3	Liberty Cargo
J. A. Jones, Panama City, Fla.	4	Liberty Cargo
Kaiser Cargo, Richmond, Calif.	3	Coastal Cargo
Kaiser Co., Inc., Rich. No. 3, Richmond, Calif.	1	Military Type
Kaiser Co., Swan Island, Portland, Ore.	5	T2 Tankers
Leathem D. Smith, Sturgeon Bay, Wis.	2	Coastal Cargo
Marinship, Sausalito, Calif.	1	Naval Tanker
	4	T2 Tankers
Moore Dry Dock Co., Oakland, Calif.	2	C2 Cargo
	1	Refrigerated Cargo
North Carolina, Wilmington, N. C.	5	C2 Cargo
New England, So. Portland, Me.	8	Liberty Cargo
Oregon Ship, Portland, Ore.	9	Victory Cargo
Pennsylvania Shipyards, Beaumont, Tex.	4	Coastal Cargo
Permanente Metals, Richmond, Calif.	15	Victory Cargo
Sun Shipbuilding, Chester, Pa.	5	T2 Tankers
Todd-Houston, Houston, Tex.	5	Liberty Cargo
Walter Butler Ship, Superior, Wis.	2	Coastal Cargo
Walter Butler Ship, Duluth, Minn.	2	Coastal Cargo
Walsh-Kaiser, Providence, R. I.	2	Military Type
Western Pipe & Steel, San Francisco, Calif.	1	C3 Cargo



Her sleek gray sides glistening in the California sunshine, the 523-foot tanker Santa Maria Hills rests on the waters of Richardson Bay, following her launching at the shipyard of Marinship in Sausalito.

TO WORLD TRADE



To World Trade—Dedicating the vessel to fulfillment of wartime tasks and to post-war world trade, Mrs. Eloi J. Amar christens Calship's SS Rider Victory. With her are Mrs. Edouard Amar (at left), matron of honor, and the sponsor's husband, Eloi J. Amar, manager of the Port of Long Beach, California.

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
MARINE UNDERWRITERS
200 BUSH STREET . . . . . SAN FRANCISCO
Offices at: Colman Bldg., Seattle • 111 West 7th St., Los Angeles

514-SHIP ARMADA OUTFITTED

(Continued from page 296)

gone into the other vessels outfitted by the Buckler companies.

In three C-4's outfitted by company workers, Fiberglas is used on shells, ceilings and deckheads. It is estimated that three-fifths of the hull surface is insulated with Fiberglas. Installing the insulation, often in places requiring the agility of an acrobat to get in and out of, calls for skill, ingenuity, patience and determination. The din of chippers, the whine of tack-welders' guns, and close contact with fellow workers, frequently make a heavy drain on the two latter qualities.

The Fiberglas insulation reaches the dock side in sheets. When the joiners have cut the material to size and eased it into place, the stud, or pin, welders take over the job. The studs, or pins, resembling oversize carpet tacks, are punched through the insulation when contact with the steel surface is made. The studs are automatically welded to the steel.

On one C-4, pin welders will use 44,500 one-inch pins, 33,170 three-quarter-inch pins, and 8500 one-and-one-half-inch pins in fastening the Fiberglas in place. Roughly, one pin is used per square foot of insulation surface, a total of 86,170 pins per ship. When the welders have finished, the tapers cover with strips of Fiberglas tape the joints between the sheets of insulation.

The 514-ship armada outfitted by the companies includes 6 Fleet Oilers and 30 LST's, in addition to the 332 Liberty ships, the 32 Victory ships, the 61 Attack Transports, the three C-4's and the 50 CVE's already mentioned. Installation of flight decking on the 50 CVE's was one of the various jobs undertaken by workers. All of these ships were outfitted in the three Kaiser shipyards in the Portland-Vancouver area—the Oregon and Swan Island Yards at Portland, and the Kaiser-Vancouver Yard at Vancouver, Washington.

KEEP POSTED

(Continued from page 299)

New Gar-Bro Cable-Splicing Rig

The Gar-Bro cable-splicing rig, recently announced by Garlinghouse Brothers, Los Angeles, Calif., is a structurally self-contained unit designed to facilitate all the necessary operations in the splicing of cable.

Any standard splicing vise may be attached to the stand, which is supported by a ball-bearing revolving base. Directly above the splicing vise is a quick-opening jaw-type vise supported by a tension member. The gripping vise is rapidly actuated by spinning a large heavy rimmed wheel. Any desired tension is put on the cable between the two vises by vertical adjustment of the tension member through a double-acting screw provided with a handwheel. The cable is easily untwisted for splicing by revolving the splicing vise stand.

This unit may be set up, bolted to a column or post, or lashed to a tree, and be working in ten minutes. Provision is made for mounting either vertically or horizontally by means of mounting pads. The overall size, set up, is 96" x 45". The weight is 250 lbs., approximately, and no section weighs more than 100 lbs. A perforated shelf mounted on the back of the splicing vise stand holds marlin spikes and other hand tools. Hooks are provided on the vertical member for other tools the workman uses.



New Line of Synthetic Rubber Abrasives

Development by its research staff of a new line of synthetic rubber adhesives is announced by The B. F. Goodrich Company, Akron, Ohio.

One is for general "utility" use and is a type of adhesive which will adhere to almost any clean surface. It serves these purposes as well as natural rubber cements in the same field, the company says.

Synthetic cements are available for heat vulcanization, air curing or cold adhesions. The compounded synthetic cements are suitable for fabric, leather and synthetic adhesions, to themselves or to each other. These adhesives have a non-toxic solvent, and will give an excellent bond with a large variety of materials. They give the same bond when used with cured or uncured Neoprene, that rubber cements give with natural rubber.

For metal adhesion, two special cements in what is known as the Plastilock 300 series, have been developed. The first is used with vulcanized Neoprene when it is bonded to porcelain, metal, etc., while the second is used with uncured Neoprene for the same purpose.

Major military products on which these cements have already had successful use include life-saving boats, rubber mattresses, belts, target tubes, tank crash pads, pontoons, tank linings, land mines, brake tubes, balloons, diving suits and use in submarines.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton



MEMORIES OF FERRY BOAT DAYS ON SAN FRANCISCO BAY

The saga of the ferry boats was the theme of the April 4 meeting of the Mariner's Club of California when Wallace D. Miracle, chairman of the S. P. Alameda Commuters Club recounted San Francisco Bay memories to a reminiscent audience.

Captain Ross Wright, Fire Boat No. 1 chief, related an interesting incident about the only sinking of a passenger ferry boat in San Francisco Bay.

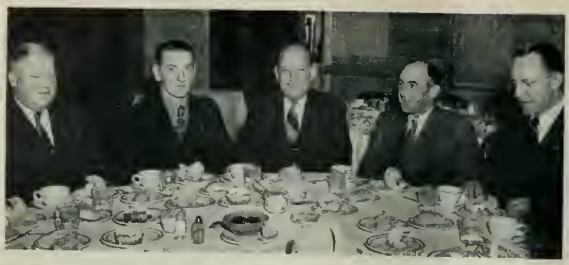


While plowing through the fog one morning in December, 1901, the ferry boat San Rafael collided with the ferry boat Sausalito and the San Rafael sank. Many years later, in the Fall of 1921, the liner Matsonia came into the bay and anchored off quarantine. When ready to proceed to dock, the anchor pulled up the engine section of the sunken San Rafael and dragged it to the dock. A Haveside Company derrick barge was called in to free the anchor.

Illustrated here is one of the several ornamental eagle caps from the oil cups that were found on the engine. The eagle cap bears the legend: "designed by I. Dreyfuss—patented May 21, 1867—7303-N-12." Several of the engineer officers, including Captain Wright, then associated with the Haveside Co., salvaged these cups.

The first ferry service in San Francisco dates back to the year 1850 when Captain Thomas Gray put the tiny steamer Kangaroo on a twice weekly schedule. During 1930, 43 ferry boats operating on the Bay formed the largest transportation enterprise of its kind in the world. It passed from the scene, however, with the opening of the San Francisco Bay Bridge in 1937 and the Golden Gate Bridge in 1938. Now only the train service boats are left.





Group of East Bay business men listening to the predicted future of shipbuilding on the Pacific Coast.

Below: left to right: T. C. Ingersol, manager, Bethlehem-Alameda; O. H. Fischer, pres., Union Diesel Co., chairman, Maritime & Harbor Comm., Oakland C of C; William M. Laughtan, gen. mgr. Bethlehem-Alameda; George Armes, pres. General Engineering & Drydock Co.; and Carl W. Flesher, regional director, U. S. Maritime Commission.

Oakland Chamber of Commerce Luncheon Honors East Bay Shipbuilders



These top executives of the East Bay shipyards rallied to the call of the Oakland Chamber of Commerce the day Carl W. Flesher (center, standing) regional director, U. S. Maritime Commission, addressed Chamber luncheon on "The Future of the Shipbuilding and Repair Industry on the Pacific Coast."



Have You Met Drew Chidester?

By B. H. Boynton

(This is the first of a series of articles on outstanding Pacific Coast steamship officials.)



Drew Chidester, Executive Vice President of General Steamship Corporation, Ltd., San Francisco.

Quiet and conservative, slight and wiry is the executive vice president of General Steamship Company, Ltd. Drew Chidester. The penetrating blue of his eyes reminds you of a seafaring man. Although he did not sail the seven seas he has planned the routes and operated the ships that sailed them.

His love for the sea as a child urged him toward the waterfront of Tacoma, Washington, watching the loading and departure of sailing ships. The romance of faraway places . . . the Orient, the South Pacific, Bali, South America . . . intrigued him to the point of applying for a job as office boy at Dodwell Company, Ltd., an old established firm of merchants and ship agents in Tacoma, that had ships plying the trade routes of the Orient. This embryonic steamship executive began his career there in 1899 at $15.00 a month. He had earned just $7.50 on this job when he was promoted to clerk in the shipping department.

Everything was peaceful on the waterfront and in this shipping office until one hot summer's day when Fred Dodwell, his boss (a very British Britisher), called: "Cheedestar, cawn't you do something about these abominable flies?" Out he went for long tapes of flypaper which he hung from the gas chandelier above his employer's desk after the boss had gone to lunch. All was fine until later that afternoon when a roar brought this young man into the inner office to hear the old man fuming! "Cheedestar, I am all stuck up with gum!" There sat the boss, his hands stuck to piles of tissue carbon letters on his desk, the letters stuck onto the desk; while the slowly melting strips of flypaper were dripping down on the boss's head and desk. Young Drew did not need to look up to ascertain what had happened. A career hung in the balance. But not for long, for he managed to unstick Mr. Dodwell and get him out of the office long enough to remove all traces of flypaper—yet he never quite knew just how the boss got so gummed up!

He remained with Dodwell Company, Ltd. from 1899 until 1915, when he came to San Francisco to open offices of the Blue Funnel Line (also a British company represented by Dodwell's in the Northwest) owned by Alfred Holt & Company. The first World War disbanded this service through the Panama Canal to Europe, and soon after Chidester joined forces with Harry Scott in forming the Trans-Oceanic Company in 1917. Having been engaged in shipping traffic since boyhood, he brought with him a wealth of technical knowledge and experience which has contributed largely to General Steamship's successful operation.

In 1920, Harry Scott, as president, and Drew Chidester, as vice president and general manager, took over the reins of the newly-formed General Steamship Corporation, Ltd., named after the successful oil firm, General Petroleum Corporation, and which was formerly headed by Commander Charles Belknap, USN (retired), as president. The company undertook the operation of American ships on an ambitious scale but soon found that foreign line agencies constituted an attractive field.

Scott and Chidester were convinced that Pacific Coast trade had vast possibilities for expansion and the agency's policy thereupon changed from one of purely American flag operation to one of international scope. From then on the company underwent an amazing development period which has thrived for over 25 years. One foreign line after another was added, until at the beginning of the present war, nine steamship lines, flying the flags of seven nations, were serviced. The agency's activities were virtually "translated into all foreign languages, including the Scandinavian," and its operation of "liner services" coupled with the handling of tramp vessels presented a more complete cross section of international shipping than could be found at that time in any other American steamship organization. The slogan, "700 ports" became almost as well known as "57 varieties."

During the middle thirties, recognition from various countries came to these men for their contribution to the upbuilding of international trade. Mr. Chidester, in 1938, was honored by the French government

(Please turn to page 86)







Scenes of the Seattle Propeller Club April meeting.

Top, left: Speakers' table includes B. Bryant, Boeing Aircraft; James C. Gow, pres. Alexander Gow, Inc.; Capt. Osterman, USSG, master, Navy Transport; F. Schmitz, Everett Pacific Shpb. Co.

At round table are Lt. Comm. A. Johnson, USN, Port Dir. Office; Rear Adm. W. H. Muater, USCG; Capt. P. G. Zeusler, USCG; Lt. Comm. J. Wright, USCG; John Pacey, ATS; E. Lee, Interocean SS Corp. (His back to camera.)

Left: J. C. Lane, supt. of Ames Shipbldg. & D. D. Co.; Paul Faulkner, P.M.R.; A. W. Paterson, gen. mgr. Canselidoted Services & Supply Co.; Merrill J. Gray, ch. engr., W. C. Nickum & Sons, and Clarence H. Garlander, pres. Puget Sound Freight Lines.



Propeller Club luncheon at Hotel Commodore, New York City, on March 7, when Major General Homer M. Groninger, commanding general, New York Port of Embarkation (seated at right end) addressed the meeting.

to post-war international trading stability.

Club secretary, Eugene Hoffman, paid an eloquent tribute to the memory of his old buddy, War Correspondent Ernie Pyle.

Port of New York, Propeller Club of United States

The Port of New York Propeller Club had the privilege of hearing how a large part of the United Nations' war machine — tanks, planes and men—that has been unleashed on Hitler's crumbling world, was transported under the supervision of Major General Homer M. Groninger, U.S.A., through the New York Port of Embarkation. At the March 7 meeting held in the Commodore Hotel an impressive military and member gathering assembled for "The Gateway to Victory" program.

Propeller Club Activities Port of San Francisco

To "tie-in" with some of the post-war problems to be discussed at the World Security Conference in San Francisco, the topic "Post-War Economics and Finance" was the subject of an interesting 30 minute speech by Oliver P. Wheeler, director of Research for the Federal Reserve Bank of San Francisco, given before the members of the Port of San Francisco, Propeller Club of the United States.

During Mr. Wheeler's speech the members were able to gather that he believes thoroughly in the Bretton Woods monetary fund as the answer



Presentation of Plaque to SS Paducah Victory by the Propeller Club of the United States, Port of Paducah, Kentucky, at dinner meeting held by the Port of Portland, Oregon, on March 16. Left to right: E. J. Griffith, pres. of Club; V. H. van der Stoop, representative Netherlands Purchasing Commission; Captain J. R. Billups, Master of Victory ship, Gwynne A. Hoss.

New Director

Lewis A. Lapham, San Francisco shipping executive and son of Mayor Roger Lapham, has been elected Executive Director of the Pacific American Steamship Association, it was announced by E. Russell Lutz, executive vice president of American President Lines, who is currently president of the Association.

"Appointment of Mr. Lapham," said Mr. Lutz, "marks an advance in staff activities of this Association made necessary by the increase in relationships of shipping with government, both legislatively and administratively, arising out of war activities and post-war planning."

Mr. Lutz said the administrative relationships with government are many and continuing, adding, "The shipowner deals with nine of the eleven Federal departments of government, six international commissions, and with numerous other executive branches of government."

The membership of the association embraces practically all United States flag dry-cargo steamship companies owned on the Pacific Coast. All companies, Mr. Lutz explained, are faced with post-war conversion problems while still carrying on their responsibilities to serve the Army, Navy and War Shipping Administration, and these are dealt with through the Pacific American Steamship Association for West Coast companies. Furthermore, he added, the Association is one of the industry organizations which joined together to form the National Federation of American Shipping, under the presidency of Almon E. Roth, and it actively participates through its representatives in the affairs of the Federation.

"There is an inevitably expanding field of activity of the Pacific Steamship Association," Mr. Lutz continued, "and it is this expanded field which has led to the selection of Mr. Lapham as especially qualified by service and experience in Pacific Coast shipping to head up the work of the association."

Mr. Lapham comes to his new position direct from the post of civilian aide to the Commanding General, Port of Embarkation, Fort Mason, where he had served with distinction since the outbreak of war.

Prior to his service at Fort Mason, Mr. Lapham was engaged in the shipping business in San Francisco. He was assistant to the President for the American-Hawaiian Steamship Company and before that he had served the maritime industry as public relations director for the Waterfront Employers Association.

For several years after his graduation from Yale, Mr. Lapham was marine editor of a San Francisco morning newspaper, the Examiner.



LEWIS S. LAPHAM

Executive Director of the Pacific American Steamship Association.

Mrs. Grady Guest at WOAMM



Never has the Women's Organization for the American Merchant Marine, Port of San Francisco, been so thrilled and inspired as by the stirring speech given by a descendent of an early California family, Lucretia Del Valle Grady, April 10, on United Nations World Security. Mrs. Grady (standing at extreme right in picture) spoke intensely on international race prejudice and how American women can be instrumental in debunking these existing prejudices through an interest in educational groups.

The women sitting in the above semicircle during Mrs. Henry F. Grady's talk are, left to right: Mrs. Paul Cronk, wife of Captain Cronk, Port Captain, USCG: Mrs. Julian Smith, wife of commanding general of U. S. Marine Corps; Mrs. Earle H. Carder, retiring president of Club; Mrs. Royal E. Ingersoll, wife of Admiral Ingersoll, commander of the Western Sea Frontier; Mrs. Pratt, wife of commanding general of Presidio, U. S. Army; and Mrs. C. H. Kells, wife of Major General Kells, commanding general, San Francisco Port of Embarkation.

Promoted in Rank

The rank of full Admiral was conferred on **Vice Admiral Russell R. Waesche**, head of the U. S. Coast Guard, following action of Congress in passing an authorization to that effect.





Left: Arthur Rosette, sales manager, and M. A. Clune, president and general manager. Right: Ed Chrysler, sales promotion manager.

THE BAY CITIES ASBESTOS COMPANY

The Bay Cities Asbestos Company, with head offices and warehouses located at Fifth Avenue and East Twelfth Street in Oakland, California, is a well-known firm of distributors, contractors and engineers, serving the Bay Area shipbuilding and industrial engineering companies by the application of insulating, refractory and packing products.

Organized in 1924 by the late Stiles S. Wells with offices and warehouse on Webster Street near Tenth in Oakland, the company specialized in the distribution and application of Johns Manville products. At that time the total working force was composed of two men, Rudy Lapp and Fred Manfredi, who by the way are still employees. Today the company has a working force of nearly 600 and an office staff of 40, ably directed by M. A. Clune, now president and general manager, who became associated with S. S. Wells in the management, as vice president, shortly after the formation of the company.

Since the outbreak of the war the company has devoted most of its facilities and activities to the completion of ships for the U. S. Navy and the U. S. Maritime Commission, and its contribution to the successful war effort, especially in the marine insulation field, has been exceptionally noteworthy. However, plans have been made to take full advantage of the expected era of marine and industrial expansion in the Bay Area, and with the company's policies under the same experienced guidance of M. A. Clune, ably assisted by the sales manager, Arthur B. Rosette, the prospects for the future seem excellent indeed.

Other members of the executive and sales staff are Bruce F. Perry, comptroller; Edward N. Chrysler, sales promotion manager; "Cliff" Clark, superintendent of contract department; and Carl Carlson and John Canaday, assistants in the contract department.



BRUCE F. PERRY
Comptroller



Carl Carlson, assistant in contact department; John Canaday, and Cliff Clark, superintendent of Contact Dept.

ERRATUM

Our humble apologies to John Kooistra of Carrier Corp. of San Francisco for calling him Walter Bradshaw of Matson Line on Page 250 of our April issue.

THE MARINE INDUSTRY

Advancements and Executive Changes





Left: G. A. Mattucci of Babcock and Wilcox Company.

Kenneth T. Connell of Shell Oil Company in Southern California.



Ray P. Anthonisen in San Francisco for Crane Packing Co.

George A. Mattucci of B & W Visits Pacific Coast

George A. Mattucci, chief marine service engineer of the Babcock and Wilcox Company, made a business trip to the Pacific Coast during March. While here he conferred with the company's regional representatives and also with several shipping company executives.

He graduated from the U. S. Naval Academy in 1924 and has been with the company for over 20 years.



C. G. Cox appointed to executive staff of Joshua Hendy Iron Works, Sunnyvale, Calif.

C. G. Cox Joins Joshua Hendy Works

The appointment of C. G. Cox to the executive staff of the Joshua Hendy Iron Works is announced by A. A. Browne, manager of engineering and sales. Cox will serve as administrative assistant to Browne, aiding in the formulation and execution of the company sales and engineering policies. He will make his headquarters at Sunnyvale, California.

Cox was formerly vice president and general manager of the Enterprise Engine Co. of San Francisco, where he has also served as sales manager.

Shell's So. California Marine Representative

Kenneth T. Connell, former local manager of Shell Oil Company, Incorporated, Oceanside Depot, has been appointed as Marine Division service representative to cover the company's extensive marine activities for the ports of Southern California. Previous to his Oceanside assignment he was in charge of marine sales attached to the local Shell office at Wilmington, during the period following Pearl Harbor.

Crane Packing's Promotions

Howard L. Asp is now sales manager of Crane Packing Company, with headquarters located in Chicago, Illinois. He was formerly branch manager of Northern California, the Pacific Northwest and the Hawaiian Territory; a post now filled by **Ray P. Anthonisen,** formerly from Buffalo, New York, where he had charge of the company business in New York State, excluding New York City. He has had extensive experience with power plants and industrial machinery, especially in the application and uses of all types of packings.

His office and warehouse are located at 259 Second Street, San Francisco, where they stock a complete supply of die-formed ring sets for use in servicing boiler feed pumps, in addition to the usual stock of spiral and coil forms of packings.



John H. Odenbach, president of the Odenbach Holding Corporation, owners of Odenbach Shipbuilding corp. of Rochester, N. Y., and Florida Shipbuilding Co.

Odenbach News

John H. Odenbach, president of Odenbach Holding Corporation, announces that they have recently established new offices at 21 West Street, New York, and appointed **Edward A. Calderon,** former chief of Bunkers and Ship Stores, Bureau of Supplies, Foreign Economic Administration, to represent the corporation as Pan-American representative.



Carl B. Steckmest, president of Steckmest and Company, ship chandlers.

Steckmest and McDougall

The well-known Portland ship chandlers, Steckmest and McDougall, have recently been reorganized. The firm is now incorporated as Steckmest and Company with **Carl B. Steckmest** as president and sole owner.

Mr. Steckmest has been in the business since 1926, and has for the last ten years had his own company. At the present time his firm is supplying the Kaiser Company's shipyards, Albina Engine & Machine Works, Commercial Iron Works, Northwest Marine Iron Works and ships of all nations too numerous to mention.

The company now represents Ederer Incorporated of Philadelphia, manufacturers of nets and seines, and has the exclusive northwest distribution of the 100 per cent marine gasoline engines for the Universal Motors Company of Oshkosh, Wisconsin.

B & W Manager Visits Distributors On Coast

J. E. Brinckerhoff, manager of the Refractories Division of the Babcock and Wilcox Company, headquarters in New York City, recently visited the company's branches and distributors in the Pacific Coast territory.

He announced that C. C. Moore & Company, the B & W representatives in Portland, will now carry a complete stock of B & W junior fire brick, also refractory mortars, castables, and plastics. C. C. Moore & Co. in San Francisco will continue to carry their usual complete line of B & W refractory products.

The Babcock and Wilcox Company are appointing the J. W. Clise Company in Seattle, as a distributor of B & W insulating fire brick products. They will carry complete stocks of these materials in Seattle and Portland, and their representatives will cover the states of Washington, Oregon, the Panhandle of Idaho, and Western Montana. The J. W. Clise Co. will operate through four separate agencies in the Northwestern territory, namely: the Asbestos Company of Seattle, Portland, Tacoma and Spokane. This arrangement is similar to that which the Babcock and Wilcox Co. have in California, where the company's refractory products are sold through the Asbestos Company of California.



J. E. Brinkerhoff, manager of Refractories Division of Babcock and Wilcox Company.

These new arrangements are deemed necessary to take care of the increasing demand for the company's products in ship repair, conversion and in servicing their other customers.

Elliott Appointments

H. S. Pahren, sales manager, is appointed plant manager, Ridgway Division, Elliott Company, according to Grant B. Shipley, president. **F. E. Millan,** director of exports, is appointed sales manager in his place.

New Branch in Texas

F. Dale Bacon, general manager of the Fire Extinguisher Division of General Detroit Corporation, announces the opening of new branch and warehouse in Dallas, Texas. **S. M. Luce** has been appointed division manager in charge of this office. This branch will handle distribution of General Detroit products in the South and Southwest.

Praise in Passing

The George Kneass shipyard in San Francisco is doing a noteworthy conversion job on the 82-foot purse seiner Dante Allegheri. The owner of the vessel has decided to install a 240-hp model 35, F-10, Fairbanks, Morse diesel reversing marine engine.

Union Oil Names Two Vice Presidents

Two men well known in San Francisco were chosen vice presidents of the Union Oil Company of California at the April meeting of the board of directors. They are **Ole Berg, Jr.,** and **W. A. Newhoff.**

Both are Union Oil veterans, each having served the company in various capacities for more than 20 years. Both are natives of San Francisco and have recently been occupying executive positions with the company's sales department. In addition, Newhoff has served for the past year as assistant to President Reese Taylor, with headquarters in San Francisco.

The promotions of Berg and Newhoff to vice presidencies attests to their outstanding work for the company.



Left to right: Ole Berg and W. A. Newhoff, new vice presidents of Union Oil Company.



The Greeks gave us a word for it... now we give it to *you*

WHEN Sperry first developed its velocity-modulated, ultra-high-frequency tube, the word "KLYSTRON" was registered by Sperry as the name of the new device.

This name — from the Greek, as coined by scientists of Stanford University — is an apt description of the bunching of electrons between spaced grids within the tube.

"Klystron" is a good name. So good, that it has come into widespread use as the handy way to designate *any* tube of its general type, whether a Sperry product or not.

This is perfectly understandable. For the technical description of a Klystron-type tube is unwieldy, whether in written specifications, in conversation, or in instructing members of the Armed Forces in the operation of devices employing such tubes.

This has prompted many requests from standardization agencies — including those of the Army and Navy — for unrestricted use of the name Klystron. In the public interest, Sperry has been glad to comply with these requests...

From now on, the name KLYSTRON belongs to the public, and may be used by anyone as the designation for velocity-modulated tubes of any manufacture.

Sperry will continue to make the many types of Klystrons it now produces, and to develop new ones.

Klystrons will contribute to the success of important new electronic navigational instruments which have been developed by Sperry for the postwar Merchant Marine.

SPERRY GYROSCOPE COMPANY, INC. GREAT NECK, N. Y.

★

Division of the Sperry Corporation

LOS ANGELES • SAN FRANCISCO • SEATTLE • NEW ORLEANS
CLEVELAND • BROOKLYN • HONOLULU

GYROSCOPICS • ELECTRONICS • RADAR • AUTOMATIC COMPUTATION • SERVO-MECHANISMS

OWESEN & COMPANY

SAN FRANCISCO • SAN PEDRO • NEW YORK



Our
NEW HOME
Corner of

FRONT AND PINE
STREETS
SAN FRANCISCO
CALIFORNIIA

WE CARRY THE LARGEST STOCK OF MARINE ELECTRICAL SUPPLIES ON THE PACIFIC COAST





Above: Outgoing orders being put up.
Left: Quick delivery counter.

PROMPT, COURTEOUS AND EFFICIENT ATTENTION GIVEN TO ALL INQUIRIES AND ORDERS

MARINE ELECTRICAL SUPPLIES





Above: Cable stock at right and in front, small switches and cord connectors at left.

Left: Part of section showing hand lamps, tape and lamp sockets.



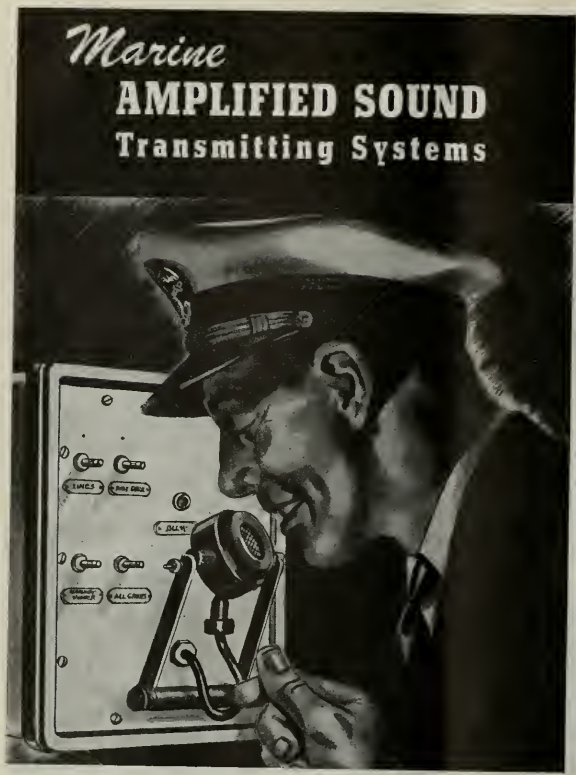


Above, left: Armored shipboard cable and rubber cable stock.
Right: Part of stock of water tight marine fixtures.

OWESEN & COMPANY

OWESEN BUILDING • FRONT AND PINE STREETS • SAN FRANCISCO

SAN FRANCISCO • SAN PEDRO • NEW YORK



REMLER MICROPHONE—LOUDSPEAKER SYSTEMS transmit and amplify voice commands . . . cover selected spaces or reach every man aboard. Indispensable at sea, while docking or at dock. Vital in emergencies. Built to stand up under severe marine exposure . . . designed for practical sea-going men by a firm with twenty-five years experience in marine wireless and electronics. • Installations on passenger ships since 1936. Hundreds of installations since Pearl Harbor on U. S. Maritime Commission and U. S. Navy vessels to meet requirements of M. M. I. Div. U. S. Coast Guard and BuShips specifications.

REMLER COMPANY, LTD. • 2101 Bryant St. • San Francisco, 10, Calif.

REMLER

Announcing & Communication Equipment

Manufacturers of Marine Communication Equipment Since 1916

Jack Young With W.S.A. in Portland

Jack Young, assistant manager of Maintenance and Repair Division of War Shipping Administration in San Francisco for the past three years, has been promoted to the position of manager of a similar division, of the W.S.A. in the Portland area.



Jack Young, chief of maintenance and repair division of War Shipping Administration in Portland.

He served as chief engineer on the Matson Line ships during the last war, and before becoming attached to the U.S.M.C. in 1936 he was port engineer of the Nelson Line. On the outbreak of war he supervised the speedy conversion to troop transports of several of the largest passenger liners in the world, and also handled the arming of many merchant vessels and troop ships.

He is held in high esteem by his many friends on the San Francisco waterfront, who wish him well in his new assignment.

Manager of 105-mm Production

Walter H. Murphy, formerly of Cleveland, now in New London, Connecticut, has been named shell production manager at the Victory Yard of the Electric Boat Company at Groton, Connecticut, where 105-mm. shells will be manufactured under a large contract for the Army. Mr. Murphy has had wide experience in the manufacture of 105-mm. shells, particularly in forge work.

It was learned that the Electric Boat Company is still in need of key personnel for the shell contract. Those that the Company urgently need are men who are experienced in forge work in connection with shell production.



Ferdinand Schmitz, Jr., president of Everett Pacific Shipbuilding & Drydock Company, Everett, Washington.

New Contracts for Everett Yard

Everett Pacific Shipbuilding & Dry Dock Company's President, **Ferdinand Schmitz**, Jr., has announced that the yard has been awarded new construction work for the Navy that will extend their shipbuilding program well into the fall months.

The contracts call for the building of two cargo barges, and for completion of six barracks ships, in varying stages of readiness. The barracks ships, 260-foot steel vessels, are equipped to provide modern living and recreational facilities for personnel at sea, and are designed to quarter 800 men.

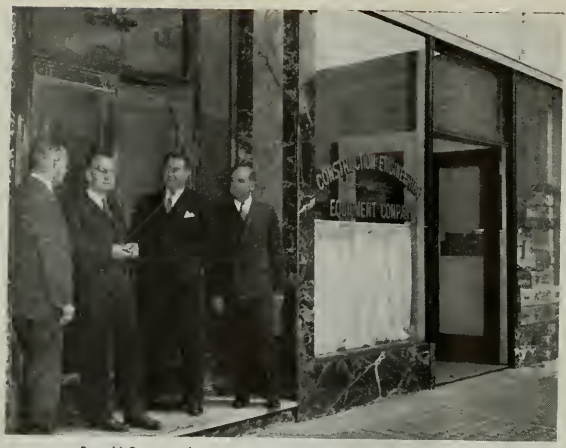
The type of work required under the new allotment will not be new to the Everett Pacific yard, which recently completed a contract for eight of the cargo barges, and now is preparing for early delivery of two barracks ships, four of that type of vessel to be constructed in the Everett area.

Awarded at this time, the new contracts insure a well-balanced work program at Everett Pacific for months to come, the management said. Augmenting repair and steel fabrication assignments with work for all crafts, the new ship construction and outfitting schedules, not only have eliminated need for what otherwise would have been heavy lay-offs of men, but have caused Mort Carraher, personnel director, to call for additional workers in nearly all crafts.

Tide Water Associated Elects New Directors

H. S. Chase, vice president in charge of manufacturing, Eastern Division, and **Drew L. Hines**, vice president in charge of transportation and supplies department, Eastern Division, have been elected directors of Tide Water Associated Oil Company, according to an announcement made by William F. Humphrey, president. **K. R. Hankinson**, vice president and treasurer, has been appointed a member of the Eastern Division operating committee.





Darcoid Company, Inc., new quarters at 110 Pine Street, San Francisco. Men facing camera are: J. Park, Robert Lyttle and Walter Harn.

Packing Company's New Quarters

Robert G. Lyttle, general manager of the Construction Engineering and Equipment Company, who recently moved to new quarters in the Owesen Building at 110 Pine Street, San Francisco, has been appointed Northern California representative and distributor of the Darcoid Co., Inc., of New York, manufacturers of flax, rubber and asbestos packings.

Lyttle, who acquired his marine training in Belfast, Ireland, has spent many years in the Orient and is well known in Manila, Shanghai, Hongkong and Singapore. Since the outbreak of war he has been the manager of purchases for the Bechtel-Price-Callahan Company in San Francisco.

Walter Harn, who has been engaged for many years in the engineering construction business in the East, the Hawaiian Islands, and the Antipodes, is the sales manager of the company. His recent connection was with the Canol project.

J. Park, the president of the Darcoid Company, who was on a business tour of the Pacific Coast, was present at the opening of the new quarters. Park served as a Lieutenant Commander in the U. S. Navy in the last war, and is very well acquainted with the marine fraternity on the Atlantic-European routes.

100th Anniversary

The 100th anniversary of Johnson & Higgins was observed on March 17. This is the first marine insurance brokerage firm to achieve its century birthday in the United States.

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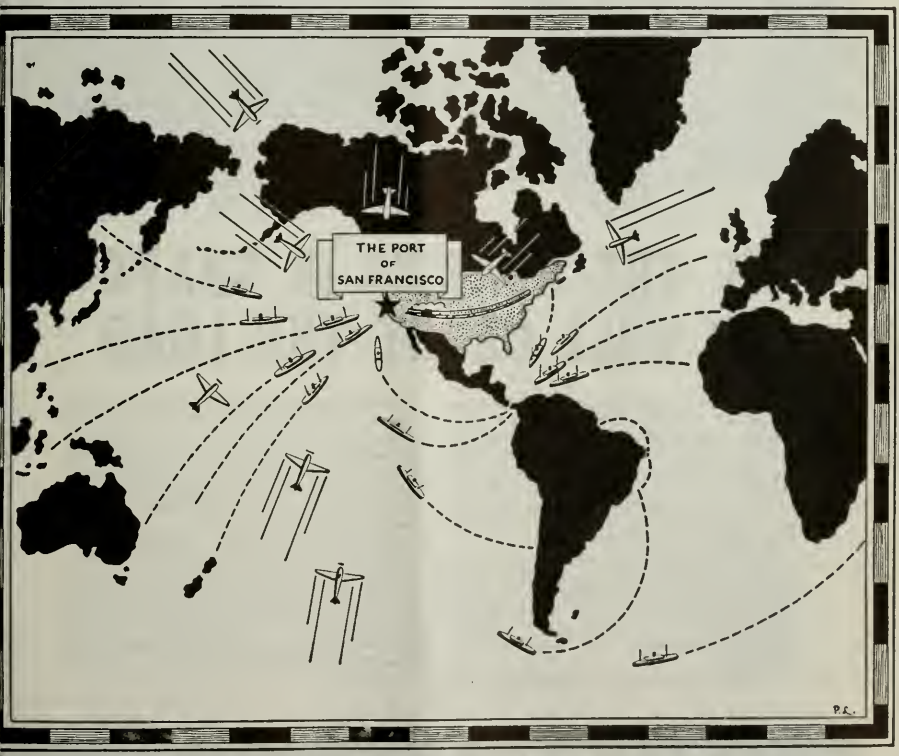
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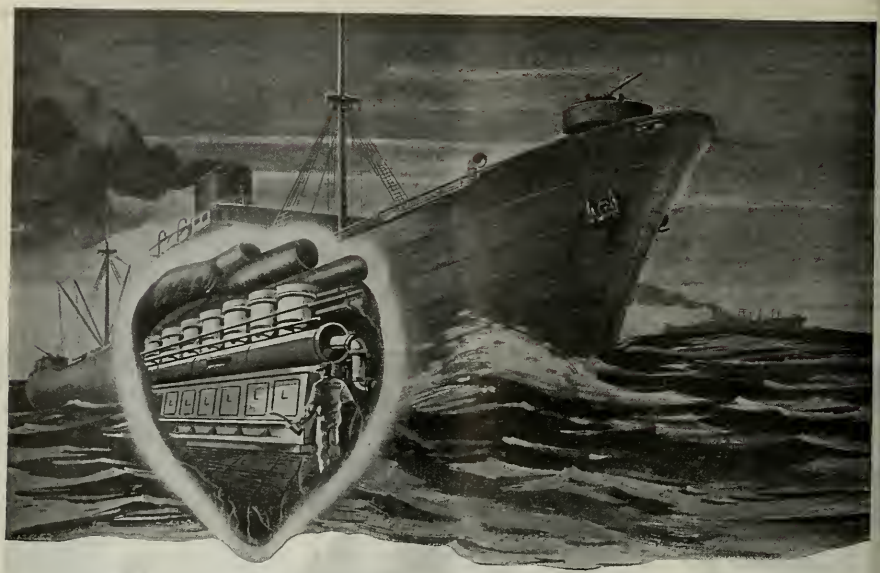
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Elliott Elects

Creation of the office of engineering vice president and additional responsibilities for other executive officers of Elliott Company, Jeannette, Pennsylvania, were announced by Grant B. Shipley, board chairman and president, following the company's annual meeting, held March 28.

W. A. Elliott, vice president in charge of sales, was elected executive vice president. **Ronald B. Smith**, manager of engineering research and development, was elected vice president in charge of engineering. **M. G. Shevchik**, secretary, was elected secretary and treasurer.

Elliott executive officers re-elected include: **Grant B. Shipley**, board chairman and president; **F. H. Stohr**, assistant to the president; **R. W. Owens**, vice president in charge of manufacturing, and **Dundas Peacock**, controller. Present directors were re-elected by the shareholders.

F. W. Dohring, general sales manager, was given added responsibilities as assistant to the executive vice president.

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Hough & Egbert Appointments

Edward Hough of Hough & E bert Co., San Francisco office, a nounces three new appointments his staff.

Fred J. Wilkinson, who is now tached to the engineering staff Hough & Egbert, served as mari



Fred J. Wilkinson now with Hough & Egbert engineering staff.

engineer in the last war. For mar years he was with the Dollar Lin later sailing as chief engineer of th President Hoover and Presider Coolidge.

J. W. Conley is now port stewar and purchasing agent of the W. H Wickersham Company. His marin experience was acquired in the eng neering departments of the Moo Drydock Co., the McDonogh Ste Co. of Oakland, and the Weste Pipe and Steel Co. of South Sa Francisco.

Norman W. Fleming joined the o ganization of the W. H. Wickersha Co. as operations and personnel ma ager in November, 1944. Since gra uating from the University of Ca fornia in 1936 he has been associate with the Kaiser Companies in th Bay Area, and lately with the Wal Kaiser Company at Rhode Island, the Marine Design section, and al with their personnel and operatio management.

Naval Architect Opens Office

Mario Palmieri, naval architec has opened offices at 111 New Mon gomery Street, Room 201.

Palmieri is now designing a pur seiner of steel construction.

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Enterprise Elections

Preparing for an aggressive position in the post-war era, directors of Enterprise Engine & Foundry Company, San Francisco, at the annual meeting elected **C. S. Herbert** executive vice president, and member of the Board.



C. S. Herbert, executive vice president and member of board of Enterprise Engine & Foundry Co.

Mr. Herbert is vested with executive direction of the engine, process machinery and combustion equipment divisions of the nationally known West Coast manufacturing firm. He is also secretary-treasurer.

Other men elected at the annual meeting to the Board of Directors follow: G. J. Panario, W. L. Andrews, A. O. Stewart, W. E. Butts, C. P. Hoehn, and C. H. Schimpff.

At the organization meeting of the Board, the following officers were elected: G. J. Panario, chairman; C. P. Hoehn, president; C. S. Herbert: H. C. McKenna, controller and assistant secretary, and R. E. Kroeck, assistant secretary.

Advancements at Caterpillar

Caterpillar Tractor Co., Peoria, Illinois, announces the following advancements in the Parts Department:

M. T. Deames, with the firm since 1929, has been named new assistant general parts manager. Assisting him will be: **A. H. Yingst**, for export and governmental sales; **T. H. Hodgins** for the Central sales division; **C. M. McKnight** for the Western and **B. W. Kramm** for the Eastern sales divisions.

Other appointments include E. L. Mason, H. F. Haven and C. D. Byrns to the positions of assistant parts managers of the three sales divisions.

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Brickseal cannot crack, blister or peel off due to sudden temperature changes because it remains semi-plastic until the surface cools, when Brickseal becomes hard as steel. Boiler can be used immediately after Brickseal application. The glossy Brickseal surface reflects heat, prevents air infiltration, and helps produce more steam with less fuel. Maintenance expense due to cracking, spalling or erosion is reduced or eliminated entirely with Brickseal.

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Frank W. Scott, branch manager of Front Groves Company in Seattle.

Seattle Manager of Frank Groves Company

Frank Groves announces the recent opening of a new branch office in Seattle and the appointment of Frank W. Scott, manager. The new office and quarters are located at 816 Western Avenue.

Scott was born in England of an old shipbuilding and seafaring family. Since 1910 the family have been located in the Pacific Northwest, where he received his education and marine training. In the last war he served in the U. S. Marines and in 1923 graduated from the University of Washington.

For many years he has been e gaged in shipbuilding and the mari supply business on the Seattle wat front, and at the outbreak of w he joined the staff of the Associat Shipbuilders, as foreman of hull co struction and outfitting. He recen relinquished his position with th company to handle the manag ship of the new Frank Groves ganization.



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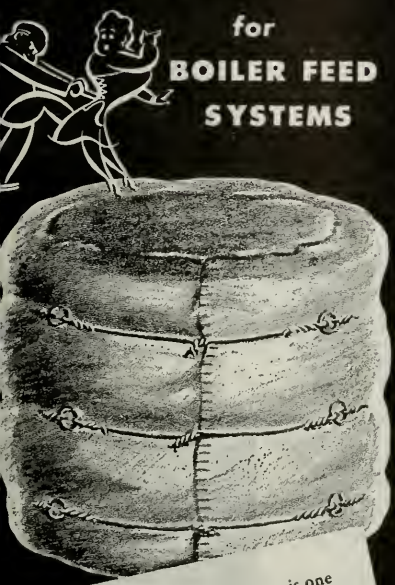
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Frank Scott

WSA & USMC Public Relations Head



William J. Donoghue

William J. Donoghue, the West Coast regional director of Public Relations for the War Shipping Administration and the U. S. Maritime Commission, is now making his headquarters at the WSA office at 65 Sutter Street, San Francisco.

"Bill," for many years was well known in the New York journalistic field, has traveled extensively since the outbreak of war in the interests of the WSA. He served for fourteen months overseas and is well acquainted with the whole Mediterranean area, especially Italy and North Africa; also France and the United Kingdom.

He has had considerable experience with the Economic Section of the Allied Commission to Italy, having spent several months as special assistant to Brigadier General William O'Dwyer, head of that organization.



William G. Wood, president of Consolidated Shipbuilding Corp., was re-elected to that office at a meeting of board of trustees. He has been president of firm since 1940. The company celebrates its 60th year of continuous operation.

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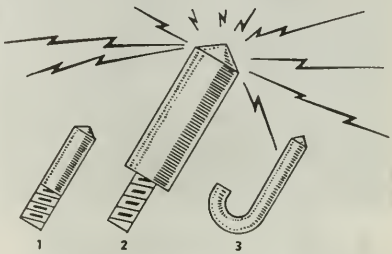
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Farrel-Birmingham's Export Sales Manager

The appointment of **Eric C. Gyllensvard** as export sales manager has been announced by Farrel-Birmingham Company, Inc. His headquarters will be 3700 Chrysler Building, New York City. He comes to this new post with valuable experience in the export sales field, having worked in South America, in India, and in other parts of the Far East .

In 1942 Mr. Gyllensvard was elected president of the Machinery and Metals Export Association. Since the war he has also served in an advisory capacity on various government committees in Washington,



Eric G. Gyllensvard, Export sales manager, Farrel-Birmingham Company, Inc.

handling export controls. He served in 1942 and 1943 on the Lend-Lease Foreign Trade Council, appointed by E. R. Stettinius, Jr., and is now serving on the Foreign Economics Administration Advisory Committee.

Swett Promotions

W. J. Kinney has been promoted to superintendent of the George E. Swett & Co., engineers, San Francisco, it is announced, while **Duward Frost** has been made assistant superintendent in charge of marine refrigeration. **H. N. Craig** becomes manager of purchases and stores, while **Irving Fairbanks** has joined the sales engineering staff.

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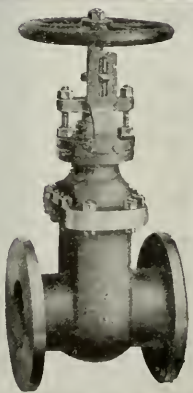
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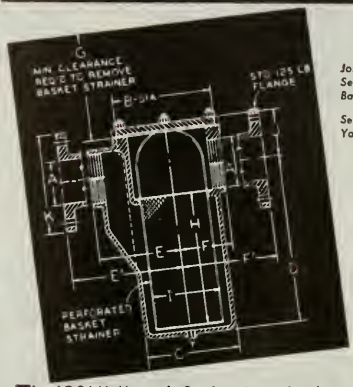
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PORT OF EMBARKATION NEWS

Captain Arthur E. Paulson, former San Francisco Bay shipping executive who has been serving with the Army in the Aleutians for the last several years, has returned and has been assigned to San Francisco Port of Embarkation for duty in Marine Operations Branch, Water Division.

Captain Paulson was associated with Snowden Transportation Company in civilian life.

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Colonel Plant Receives Honor Medal

Colonel Thomas B. Plant, widely known San Francisco shipping executive now serving in the Army Transportation Corps, recently received the Legion of Merit Medal for his work in water transportation in the Southwest Pacific Theater.

The medal was presented by Major General C. H. Kells, Commanding General of the San Francisco Port of Embarkation, where Colonel Plant is now stationed as Deputy Port Commander for Operations.

The award covered "exceptionally meritorious conduct in the performance of outstanding services" during the period from March, 1942, to April, 1944, when Colonel Plant was directly responsible for all water transport activities in the Southwest Pacific Area. The citation further states: "His capacity for working long hours day after day, his wide technical knowledge, and his foresight in visualizing future developments have contributed in marked degree to the successful operation of the war in the Southwest Pacific Area."



Colonel Thomas B. Plant, former executive of Americon Hawaiian

Colonel Plant's home is in San Francisco. He was an executive of American-Hawaiian Steamship Company at its San Francisco headquarters when he entered Army service.

Capt. Scammell Now Commodore

San Francisco's District Coast Guard officer for the Twelfth Naval District, William Kirk Scammell, was promoted from captain to commodore.

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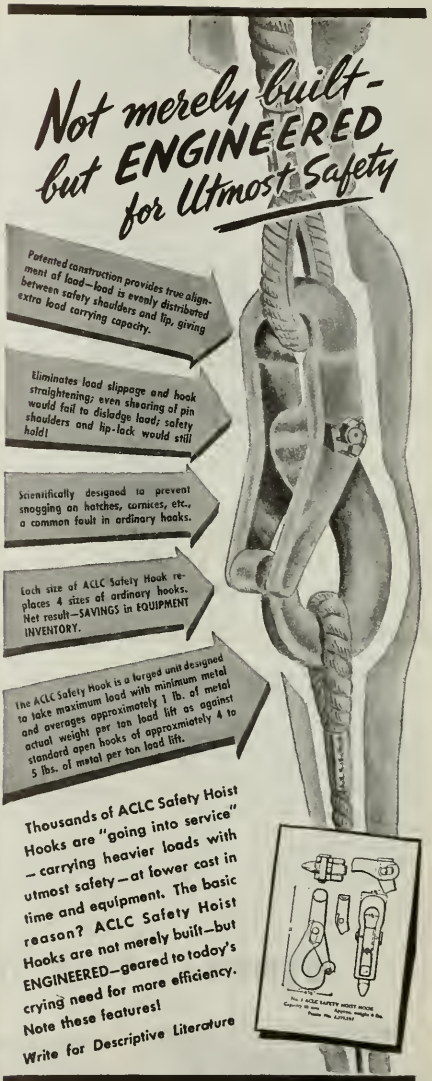
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Not merely built— but ENGINEERED *for Utmost Safety*



Patented construction provides true alignment of load—load is evenly distributed between safety shoulders and lip, giving extra load carrying capacity.

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Scientifically designed to prevent snagging on hatches, cornices, etc., a common fault in ordinary hooks.

Each size of ACLC Safety Hook replaces 4 sizes of ordinary hooks. Net result—SAVINGS in EQUIPMENT INVENTORY.

The ACLC Safety Hook is a forged unit designed to take maximum load with minimum metal and averages approximately 1 lb. of metal actual weight per ton load lift as against standard open hooks of approximately 4 to 5 lbs. of metal per ton load lift.

Thousands of ACLC Safety Hoist Hooks are "going into service"—carrying heavier loads with utmost safety—at lower cost in time and equipment. The basic reason? ACLC Safety Hoist Hooks are not merely built—but ENGINEERED—geared to today's crying need for more efficiency. Note these features!

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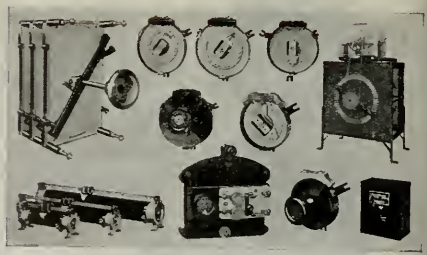
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RELAYS - RESISTORS - RHEOSTATS

WARD LEONARD ELECTRIC COMPANY
59 SOUTH ST., MOUNT VERNON, N. Y.

DREW CHIDESTER

(Continued from page 307)

with the title of Chevalier of the Order of the Legion of Honor. Likewise, Mr. Scott was honored by the Italian government and very recently, the King of Sweden bestowed the Royal Order of Vasa, First Class, on him.

As for a thumbnail sketch of Drew Chidester. He is dapper in appearance with clear blue eyes and steel grey hair, which he parts in the center. Until recently, Mr. Chidester's spare moments have been spent on his farm near Redwood City. He modestly states that his wife has the green fingers, but they both wax enthusiastic over the fruit and vegetables they have raised. His sports are golf and riding and his hobby, astronomy. In San Francisco, the Chidesters live high on top of Russian Hill overlooking the harbor, and their view includes the General Steamship's famous Pier 41.

New Ship Service Company

A new ship service company, known as the General Ship Service Company of Los Angeles, has been formed and is now operating in temporary quarters at 705 B Street in Wilmington, pending completion of a new building located at 216 North Figueroa Street, Los Angeles. The general manager of the new company is C. E. Freeman of the General Ship Service Company, San Francisco.

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Chipping · Wet Sandblasting
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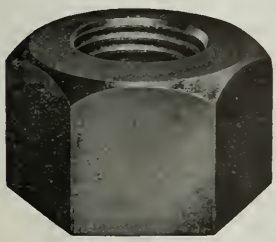


88-96 Clay Street GArfield 0186 San Francisco

AS SURE AS THE SWALLOWS' RETURN

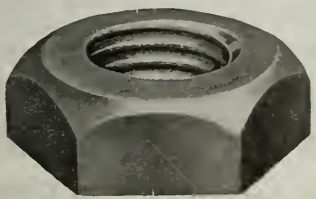
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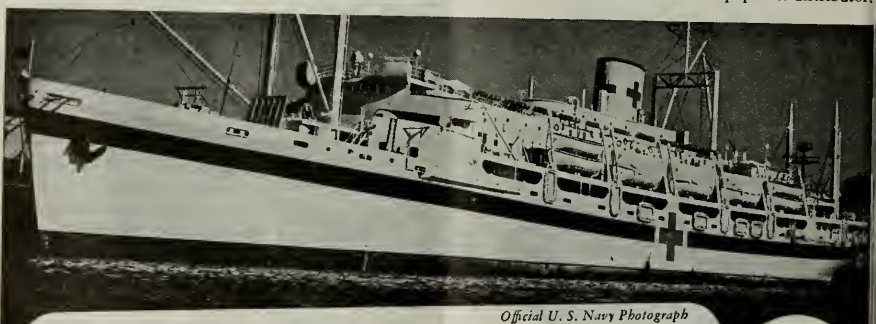
MILESTONE FOR ASSOCIATED OIL EXECUTIVE

William F. Humphrey, president of Tide Water Associated, congratulating H. T. Earl, assistant vice president on his 40th anniversary with company.

Standard Machinery

Bob Hughes, Howard Wilson and Carroll Winrod announce the establishment of Standard Machinery Company, with offices at 112 Market Street, San Francisco. The new concern will represent manufacturers of equipment and supplies for construction, highway, mining, logging, marine and industrial uses, throughout the Western States.

All three principals have had years of experience in the equipment field and are well known in the trade. R. A. Hughes and J. H. Wilson were formerly connected with a prominent Western equipment distributor.



Official U. S. Navy Photograph

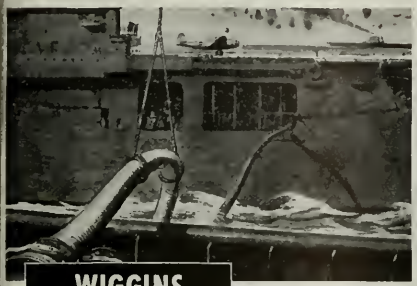
U.S.S. COMFORT—*Built for Heroes!*

The U.S.S. Comfort is one of three shining new hospital ships built for the Navy out of standard C-1 cargo ship hulls. Each of these ships—the Comfort, Mercy and Hope—contain all the facilities of a hospital ashore and the auxiliary equipment to care for the 700 patients and 400 in crew.

It is a matter of deep satisfaction to us that LIDGERWOOD Electro-Hydraulic Steering Machinery, which is used on many ships of the C-1 class, has been chosen for these ships of mercy as well. LIDGERWOOD Marine Auxiliaries, in service on both merchant and naval vessels of all types, have proved themselves over the years for economical, efficient and thoroughly dependable operation under all conditions.

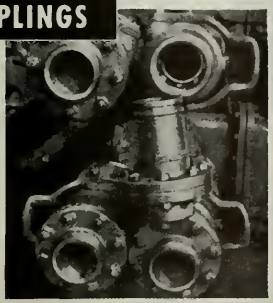
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WIGGINS QUICK COUPLINGS

Wiggins Installation On Naval Vessel



Whether it's hazardous transfer of liquids at sea or loading a tanker in port, Wiggins Quick Couplings add Safety and Speed to Marine operations. It insures a quick "get-away" when sudden storms, fire hazards and other dangers are present.

For speed in connecting, just match two ends together and swing the lever forward! Saves many minutes in making fueling connections in port or in a rough sea. Eliminates danger of crushed hands while bolting flanges.

For safety in disconnecting, merely throw the lever back while holding down the latch. Simple and easy as that, in only a matter of seconds.

Wiggins Quick Couplings have been used on Naval vessels since 1938, and are now being used by the U. S. Coast Guard for Class 11 lines other than steam. For speed, safety and economy, and where seconds count, specify Wiggins Quick Couplings. Available in 4" and 6" sizes.

E. B. Wiggins Oil Tool Company, Inc.

Main office and factory: 3424 E. Olympic Blvd., Los Angeles 23, Calif. Detroit: 2159 General Motors Bldg., Detroit 2. New York: Grand Central Terminal Bldg., Rm. 2718, N. Y. 17, N. Y. Chicago: 230 N. Michigan Ave., Chicago 1, Ill. Pacific Coast Distributors: Main office: Brooks Equipment Co., 636 Potrero Ave., S. F. 10: L. A. office: 1150 S. Hill Street, L. A. 15.

REX-TUBE

Top choice for tough jobs!

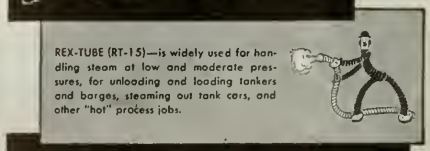
• Put REX-TUBE type RT-15 on your tough, hard-to-handle connection problems. Then watch what happens when this rugged, high-quality flexible metal hose takes charge of the heavy-duty assignments! You can forget all about frequent replacements—costly delays. For RT-15 is famous for its ability to take punishment; to keep right on outperforming and outlasting many other types of hose under the roughest usage you can give it.

There are ample reasons why production men choose REX-TUBE type RT-15 when it comes to taking hard knocks. Illustrated below are just a few of RT-15's many outstanding features. Write us today and ask for Booklet E-144.

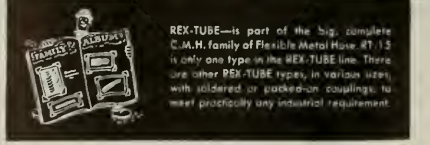




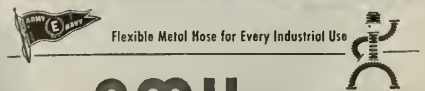
REX-TUBE (RT-15)—is strong and well-constructed to take years of wear and tear. Made from heavy strip steel or bronze. Interlocked design, with inner packing of high-grade asbestos.



REX-TUBE (RT-15)—is widely used for handling steam at low and moderate pressures, for unloading and loading tankers and barges, steaming out tank cars, and other "hot" process jobs.



REX-TUBE—is part of the big, complete C.M.H. family of Flexible Metal Hose. RT-15 is only one type in the REX-TUBE line. There are other REX-TUBE types, in various sizes, with soldered or packed-on couplings, to meet practically any industrial requirement.



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L to r: B. F. Carter, adm. asst. to Carl Flesher, regional director of Maritime Commission in Oakland, Calif.; Edward Sammons, pres. of Oregon Wor Industries; William C. Schmitt, pres. of Schmitt Steel; W. E. Kerr, oldest employee in point of service with company; and Johnnie Carpenter, master of ceremonies, from radio station KOIN of Portland, Oregon.

AWARD

The Maritime "M" Pennants have been awarded to Schmitt Steel Company of Portland, Oregon, on February 22; and to Chicago Pump Company on April 21.

90 Miles in the Puffs • Danforth Holds . . .
CAPTAIN TURNS IN





Photos courtesy A. E. Fraser
STONNINGTON BOAT WORKS, builders
"Captain Nathaniel B. Palmer."

Report on the performance of a 75-lb. Danforth during hurricone, by Capt. Robert B. Moran, skipper 56' "Capt. Nathaniel B. Palmer", 28 tons, 6' draft, Stonington, Connecticut:

"We left the dock a little before dark and stood out into the harbor to anchor. We got our ranges from the breakwater lights and dropped anchor. We used two $\frac{7}{16}$" wire cables hooked to the 75-lb. Danforth, in 15 feet of water. Fifty fathoms of wire was let out. • At the height of the storm the wind reached a velocity of 80 miles—90 miles in the puffs. It was North-easterly during the hurricane and then shifted, after a lull, to the Northwest and blew hard the rest of the night. One man stood watch to check ranges and the rest of the crew turned in. The boat did not drag. • The other vessels in the fleet have 150-lb. regular type anchors, but did not dare use them and preferred to ride out the storm under power. • All agreed that the Danforth gave a most satisfactory performance."



Danforth Anchors protected by U. S. and Foreign Patents

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SUCCESSFULLY SAIL THE SEVEN SEAS
In Thousands of Ships of Many Types

Rolagrip Pipe Couplings supplied to the leading shipyards number into the hundreds of thousands.

In cargo ships of all classes, tankers, mine sweepers, sub chasers, escort vessels, carriers, troop ships and corvettes Rolagrip Pipe Couplings are successfully sailing the seven seas.

Rolagrip Pipe Couplings are credited with the saving of millions of man hours in ship building due to their speedy installation.

Under strenuous usage they are giving dependable and satisfactory service on many lines aboardship, including bilge, ballast, sanitary, fuel oil transfer, fire-mains, deck drains, overflows, cargo oil piping, air vents, sounding tubes, soil piping, salt water systems, and water circulating systems.

Despite steadily increasing demand, prompt shipments are maintained on Rolagrip Pipe Couplings, as well as precision welded Segweld Fittings and Gruvagrip Couplings for grooved end pipe.

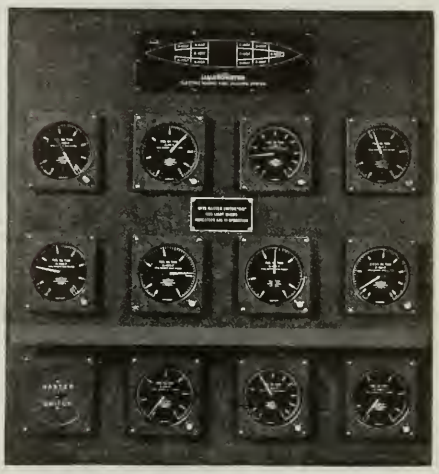
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Any number of indicators may be mounted on a panel to indicate the amount of fuel, lubricating oil, water or other liquids stored aboard ship. The slightest movement of the leverage-type float units installed in the tanks is transmitted electrically to easily read dial indicators. Although extremely sensitive to slight liquid level changes, these gauges are ruggedly constructed to withstand the vibration and shock to which all marine equipment is subjected.

The electrical portion of the transmitter is effectively sealed from contact with the tank liquid by means of a metal sealing bellows. The electric indicators may be located at any distance from the tanks, and the system is not affected by voltage drop.

Other Liquidometer products include Hydraulic Rudder Angle Indicators, Levelometer Hydrostatic Fuel and Water Level Indicators, Liquidometer Hydraulic Morine Type Tank Gauges, Liquidometer Hydraulic Position Indicators, and Levelometer Draft Indicating Instruments.

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A fourth gold star to be added to "M" pennants have been presented to W. & J. Sloane of New York and the Pittsburg Works of Columbia Steel Company, a subsidiary of U. S. Steel at Pittsburg, California.

San Pedro Award

A new flag with four stars affixed now snaps proudly from Bethlehem's flagstaff, at the San Pedro plant, signifying the fourth successive renewal of the Army-Navy "E" award.

This flag, customarily awarded for a half year, has been given in this instance for a full year before being considered for the next renewal, in view of the excellent record at the yard.

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The Modern Gas Turbine, by R. Tom Sawyer, B. of E.E., M.E., Engineer, Diesel Equipment, American Locomotive Company (Prentice-Hall, Inc. $4.00). This book brings together a wealth of useful information on the modern gas turbine and its varied uses as a supercharger and prime mover, including up-to-date data on jet propulsion. It contains 131 line drawings, halftones, blueprints of various types of gas turbines, as well as charts, graphs and tables of abbreviations and symbols.

Milling Machine Operations, by Lewis E. King; The MacMillan Company; 5½" x 8½"—119 pages. This is Number 2 of a series by the same author on machine shop operations. Like Number 1, on Lathe Operations, this book covers operations from nomenclature through all milling operations. Thoroughly covers its field, but current reading must supply the practices of carbon cutters, for the situation changes daily. Price $1.75.

Plastics—Instructions for Milling, published by Plastics Publishing Company, P. O. Box 968, Rochester, N. Y. A collection of machining practices recommended by the manufacturers of most of the readily recognized trade-maked plastics. Price $1.00.

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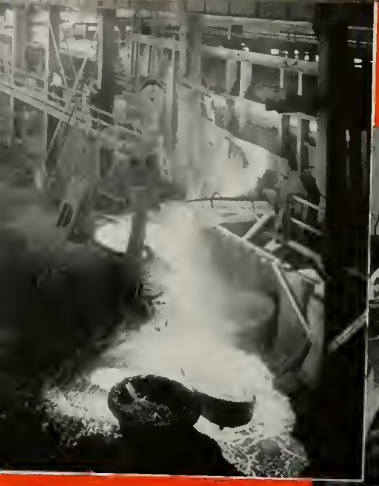
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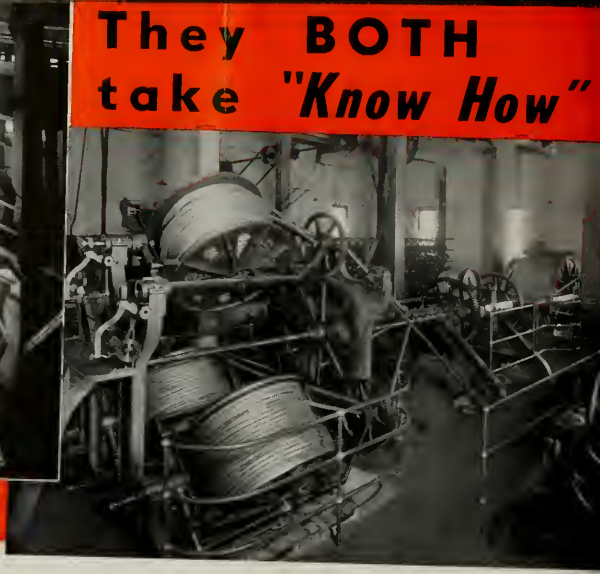


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AUDITED BY BUREAU OF CIRCULATIONS

bscription rates:
year, $1.50; two years, 0; three years, $3.00; for- , $1.00 additional per year; e copies, 25c.

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PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
Offices in: NEW YORK CITY . . . . . 16 West 46th Street, Telephone BRyant 9-8436
LOS ANGELES . . . . . 816 West 5th Street, 13. Telephone MIchigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.

ROPE . . . must be Ready!



• Weary survivors of a sinking ship, rescued from the sea with rope, board a Coast Guard convoy cutter by rope ladders. The wounded man in the bow of the lifeboat must be carefully swung aboard on a stretcher provided with special rope riggings.

• Rope is a sinew of war; essential to waging war—essential to saving lives. Demands for rope from the Army, Navy, Marine Corps, Coast Guard, Merchant Marine and essential war industries strain our capacity to the utmost. Next time you wonder why you can't get all the good Columbian Rope you want—remember that Uncle Sam's boys must have the lion's share of it. When invasion is relaxed, and ships require no more than a normal complement of rope—then, Columbian Rope will be available to you. They need the best now—but, as always the best is worth waiting for.

COLUMBIAN ROPE COMPANY
400-90 Genesee St.
AUBURN, "The Cordage City," N. Y.

Red
White
Blue

ARMY NAVY

Columbian ROPE IS A SINEW OF WAR

Our Post-War Merchant Marine

Pacific MARINE REVIEW

In our editorial comment for May we called for a common sense realistic attitude toward our post-war merchant marine problem. Our suggestions were to:

(1) Promptly sell all the "Libertys" we can to any buyer in the world and scrap the remaining "Libertys."

(2) To immobilize (for future emergency) under care of the Army and the Navy the fleets of merchant vessels converted to special war use under their direction.

(3) To build on the foundation of our fleet of good modern merchant vessels a modern merchant marine to serve American commerce.

It is our purpose here roughly to analyze the post-war fleet that would be available for American commerce, assuming suggestions Nos. 1 and 2 have been adopted and put into practical effect.

No complete analysis of the American merchant fleet as of any recent date has yet been published. However, we have a rough analysis of the types of vessels built in 1943 (the peak year) and of their dispositoin.

The shipyards of America in that year produced 1896 vessels for U.S.M.C. Our Eastern editorial representative, T. Orchard Lisle, submits the following rough analysis of the types composing this total.

First, there are to be subtracted from the total those types that are definitely not in the commercial categories so far as our overseas merchant marine is concerned. These include: 114 military types other than transports; 57 Libertys finished as tankers; 46 seagoing tugs; 16 Great Lakes ore carriers; 33 small coastal cargo vessels; 27 concrete barges; and 28 small coastal tankers. This reduces the total of seagoing, self-propelled ships of over 2000 d.w. tons to 1575.

Of this total the Liberty type freighters, considered too slow and uneconomical for modern cargo liner service, number 1238 or 78 per cent. The balance of 337 vessels comprises: 162 C-type fast modern cargo vessels; 167 seagoing tankers; and 8 miscellaneous. These figures give C-type fast cargo carriers and tankers approximately 11 per cent of the total for each type.

Since the majority of American seagoing tankers are operated in foreign and domestic routes by the oil companies and do not enter into the competitive public carrier trade it would seem a logical conclusion that the real problem of American post-war merchant marine narrows itself so far as the

(Page 332, please)



U. S. Coast Guard sub-busters strike out to take up their part in the convoy escort duty as they sweep the shipping lanes.

The Coast Guard 1944 Construction Program

A 125-foot cutter.

(Official Coast Guard photo)



DURING 1944 U. S. Coast Guard completed construction of 37 major vess ranging from 73 feet to 290 feet length, and of 346 smaller craft, cluding boats and barges. Several these types are shown in the acc panying illustrations.

The construction of four 269-f ice-breakers and one 290-foot breaker is considered the year's c standing accomplishment of the Co Guard Naval Engineering Divisi The work of one of these vessels (Mackinaw) in breaking up heavy on the Great Lakes, and the explo of two others (the Eastwind a Northwind) against the Germans high latitudes off Greenland, hi received national attention. A co plete illustrated description of th ice-breakers appeared in the Mar 1945, issue of Pacific Marine Revi

Other important completions d



83-foot cutter.

sty - three feet of
ght, one of the
oast Guard's fear-
is "Flea Fleet" pa-
ol boats goes over
e bumpy surface of
e sea.

(Official Coast Guard
photo)







Top of page: 40-foot fireboat.
Center: 25-foot 10-inch motor surfboat.
(Official Coast Guard photo)
Bottom: 36-foot 8-inch motor lifeboat.
(Official Coast Guard photo)

ing 1944 were twenty 180-foot Iris class cutters; one 114-foot river tender; six 110-foot tug class cutters; three 100-foot tender class cutters; and two 73-foot intercoastal waterway tenders.

The completion of 20 Iris class cutters concluded a construction program of thirty-nine 180-foot tender class cutters for the Coast Guard. In addition to these Iris class cutters, the program included 13 Cactus class cutters, five Mesquite class cutters and the cutter Ironwood. As urgent need existed for this type of vessel to assist in carrying out important military duties, construction of them was carried out with dispatch and all 39 vessels were completed in approximately 42 months.

Still another important achievement during 1944 was the completion of six 110-foot tug class cutters.

Also completed during 1944 were twenty-two 83-foot cutters, terminating a construction program of 230 vessels by Wheeler Shipyard, Inc., for the Coast Guard. Yet another important small boat construction program completed during 1944 was that of twelve 64-foot harbor patrol boats.

The table shows types and numbers of small craft built in 1944:

Type	Number
52′ Buoy Boat	2
40′ Buoy Boat	9
40′ Fireboat	1
36′8″ Motor Lifeboat	9
32′ Surfboat (Chemold)	1
30′ Rescue Boat	10
26′6″ Motor Launch (Spec.)	4
26′ Cabin Motor Launch	13
26′ Monomoy Surfboat	18
26′ Drill Boat	15
26′ Cabin Motor Launch (Spec.)	1
26′ Motor Whale Boat	1
25′10″ Motor Surfboat	23
25′6″ Self-Bailing Surfboat	10
24′6″ Race Point Surfboat	16
24′ Motor Cargo Boat	28
23′ Monomoy Surfboat	17
23′ Motor Whale Boat	10
23′ Cabin Motorboat	7
20′ Motor Cargo Boat	10
20′ Dinghy	18
19′ Dory	29
18′ Motor Dinghy	4
16′ Dinghy	29
16′ Skiff	15
13′ Dinghy	12

Upgrading Courses on Pacific Coast

(All photos official photographs, U. S. Maritime Service)

THE UNITED STATES Maritime Service was originally established by the Federal Government to offer training and upgrading to officers and men already serving in the merchant marine. Expanded wartime shipbuilding gave the Maritime Service the added job of training new men for the merchant marine. However, the original mission of the Service—that of training a more skilled and proficient merchant marine personnel within the industry—is being conducted daily in USMS Upgrading Schools in port cities on all three coasts.

For the information of the Pacific Coast industry, and particularly the men at sea desirous of advancement through self-improvement, Pacific Marine Review presents an outline of Maritime Service facilities and schools offering training on the Pacific Coast to officers and unlicensed men already serving in the merchant marine.

Enrollment Can Be Made at Any USMS Pacific Coast Enrolling Office

Portland.....520 SW Morrison St.
Los Angeles .....514 West 6th St.
San Francisco .....1000 Geary St.
Seattle.....808 Second Avenue
Wilmington .....326 Avalon Blvd.

NOTE: Time spent attending any U. S. Maritime Service School is not deducted from allowable shore leave.

USMS Mates and Engineers Upgrading Schools

1000 Geary Street, San Francisco; and 1427 Main Street, Seattle.

Qualifications

Officers who desire to raise their grade or license to Second, First or Chief Mate, or to Second, First Assistant or Chief Engineer, must possess unexpired licenses with sufficient sea time since December 7, 1941, earned aboard ocean-going, coastwise, or Great Lakes vessels, to qualify for raise in grade of license.

Course

New classes form every Monday. Classes are conducted six hours daily, Monday through Saturday. Course lasts for a maximum of four weeks.

Engineering subjects taught in-



Top: Lt. Comdr. J. A. Mattson, USMS, holder of the Merchant Marine Distinguished Service medal, and Senior Deck Instructor at the USMS Upgrade School in San Francisco, clarifies a point for members of the deck class.

Bottom: On a field trip to Hendy Iron Works at Sunnyvale, California, U. S. Maritime Service engineering officers receiving upgrade instruction get pointers from Charles C. Curtis, Hendy technician, at one of the company's steam turbines.





clude turbines, boilers, auxiliary machinery, reciprocating engines, inspection rules, diesel operation, machine shop practice, electricity, first aid, safety appliances, lubrication, refrigeration, fire equipment and fighting, instruments, and deck machinery. Instruction includes lecture courses and practical demonstrations in shipyards, plants and aboard ship.

Deck subjects taught include hull construction, laws, cargo and cargo loading, trim, piloting, celestial navigation, seamanship, small boat handling, first aid, safety apparatus, signaling, reports and ship's business, rules of the road, wind, weather and current, and use of ground tackle.

Pay During Training

U. S. Maritime Service officer enrollees are paid the base pay of the rank in which they are enrolled or recalled, in addition to quarters and subsistence allowance. Licensed officers not desiring to enroll in the U. S. Maritime Service receive standby wages according to WSA scale. Travel fare and meals are provided from the port of enrollment to the nearest Upgrade School. Textbooks are furnished.

USMS Able-Seaman Upgrading Schools

Pier 1½, San Francisco; 1427 Main Street, Seattle; Berth 185, Wilmington.

Qualifications

Ordinary seamen may qualify for AB Upgrading courses of various lengths, depending on the following qualifications:

(1) Ordinary seamen with six months in the deck department are eligible for a 30-day course.

(2) Ordinary seamen with 9 months in the deck department are eligible for a 15-day course.

(3) Ordinary seamen who are graduates of a U. S. Maritime Service Training Station with 3 months in the deck department are eligible for a 15-day course.

The length of the courses may be reduced for men possessing a USCG Lifeboat Ticket.

Top: Future Able Seamen Glenn A. Willacy and Gerrold J. Wheeler are given professional pointers on making an eye splice from Chief Boatswain's Mate Sam Telford.

Bottom: At the U.S.M.S. Able Seamen School at Pier 1½, San Francisco, Chief Boatswain's Mate Telford explains the rigging of a breeches buoy to two ordinaries.

Course

Classes form every Monday.

Subjects taught include boxing the compass, lookout duties, cable and rope splicing, canvas work, rigging, abandon ship, lifeboat and fire drills, first aid, fire fighting and prevention, small boat handling and navigation, use of safety apparatus, quartermaster duties, blinker and code flag procedure, rules of the road and piloting.

Pay During Training

Base pay is $66 per month, plus $3.00 per day in lieu of board and room—a total of $156 per month. Travel fare and meals are provided from the port of enrollment to the nearest Upgrading School.

USMS Cooks and Bakers Upgrading Schools

San Francisco, Portland, Seattle and Los Angeles.

Qualifications

Course is open to any messman or utility man possessing 4 months' sea time in steward's department. Graduates are raised to Cook and Baker ratings. Men certificated as Cooks or Bakers may be upgraded to Chief Cook.

Course

Classes form every Monday. Course lasts for a period of from six to eight weeks.

Subjects taught include menu planning, meat cutting, meat preparation and roasting, salad preparation, fruit and vegetable preparation, baking (including bread, pies and pastry), dietetics and food purchasing. Instruction is given in the storage of food under refrigeration. Students participate in daily preparation of food at school cafeterias for practical experience and instruction. Field trips to meat packing plants, hotels and public cafeterias are made by student classes.

Pay During Training

Base pay, rated as Stewards Mates 2/c, is $54 per month, plus $3 per day allowance in lieu of room and board. Travel fare and meals are provided from the port of enrollment to the nearest Upgrading School. Textbooks are furnished.





Top: Under the watchful eye of instructor Fred Spiess, future Maritime Service cooks and bakers shape up a man-sized meat loaf. At the end of a 56-day training course, graduates receive Second Cook and Baker Certificates.

Bottom: Pupils get the fine points in the art of butchering. Instruction in meat cutting is given in San Francisco packing houses.



A Streamlined Steam Tug

THE STREAMLINED harbor tug Edward J. Engel, designed by Joslyn & Ryan, naval architects and marine engineers of San Francisco, at the request of Consolidated Steel Corporation of Maywood, California, will be built and equipped at their Newport Bay, California, shipyard for the Atchison, Topeka & Santa Fe Railway Company.

This tug is of all-welded steel construction throughout, with a length between perpendiculars of 142′ and over-all beam of 29′, and is provided with very complete facilities for harbor use. The arrangement of the hull provides locker space, sanitary accommodations and dining rooms for the crew of eight officers and men.

An innovation in the hull construction is a 1¼″ sheerstrake four feet deep which serves as a fender for the full length of the hull, thus eliminating the use of rope fenders. Dimensions of scantlings and the general arrangement of hull are shown on the drawings herewith.

The main deck house, boat deck house, wheel house and stack are streamlined, and the color scheme of black, red and yellow, with accents of blue on the fittings, resembles that of the Santa Fe "Chief," crack overland luxury train.

In the streamlined pilot house the windows are by the Kearfott Engineering Company of New York. These windows, of the K-225 type, are crank operated and are made with curved surfaces and frames to fit the streamlining of the pilot house. Kearfott designers and technicians are to be congratulated on an outstanding job of fitting these windows to the hull structure.

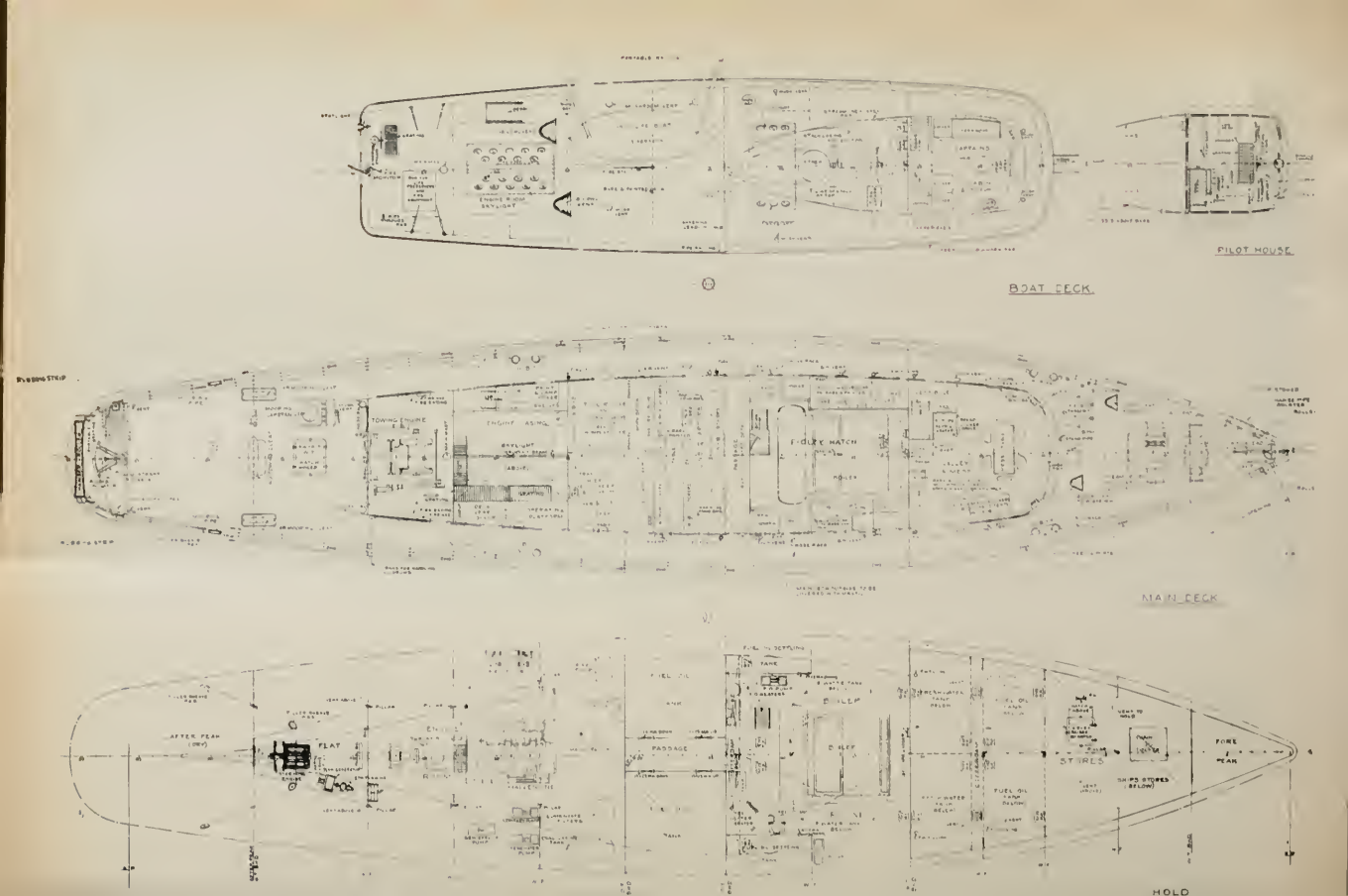


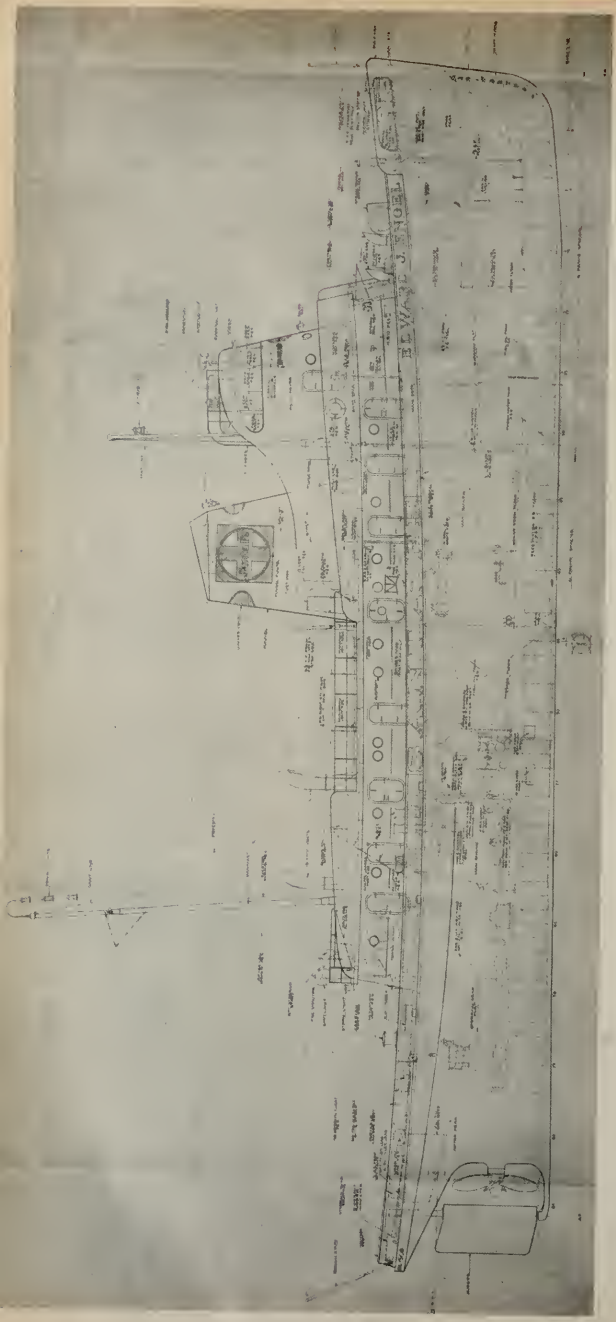
Launching party at launch of tug Edward J. Engel. The group includes Mrs. Kenneth Engel, sponsor; Miss Jane S. Alexander, maid of honor; and Alden Roach, president of Consolidated Steel Corp.

Machinery Details

Propulsion is by means of a Skinner Unaflow steam engine of 3 cylinders 25 inches diameter and 20-inch stroke, operating on 180-psi gage steam with 100° F. superheat at the cylinder head inlets, and with 26 inches of vacuum maintained in condenser. Rating of this engine is 1200 shp at 130 rpm and 900 shp at 118 rpm. The main condenser is 2 pass 1800 sq. ft. surface type furnished by the Turl Iron & Car Co., Inc.

Condensate from the condenser is pumped through the inter and after condensers of the air ejector to a


PILOT HOUSE
BOAT DECK
MAIN DECK
HOLD



Permutit oil removal filter, which in turn discharges to a feed and filter tank in the boiler room.

The boiler feed water pump takes suction from the feed and filter tank or from the reserve feed water tanks located under the boiler.

The feed pump discharge passes through a pressure type feed water heater (furnished by Struthers Wells) where exhaust steam at 10# is used as the heating medium. The feed water is heated to a temperature of 230° F. before going to the boiler.

Auxiliary feed is supplied to the boiler with an injector which can be used as a standby for the feed pump.

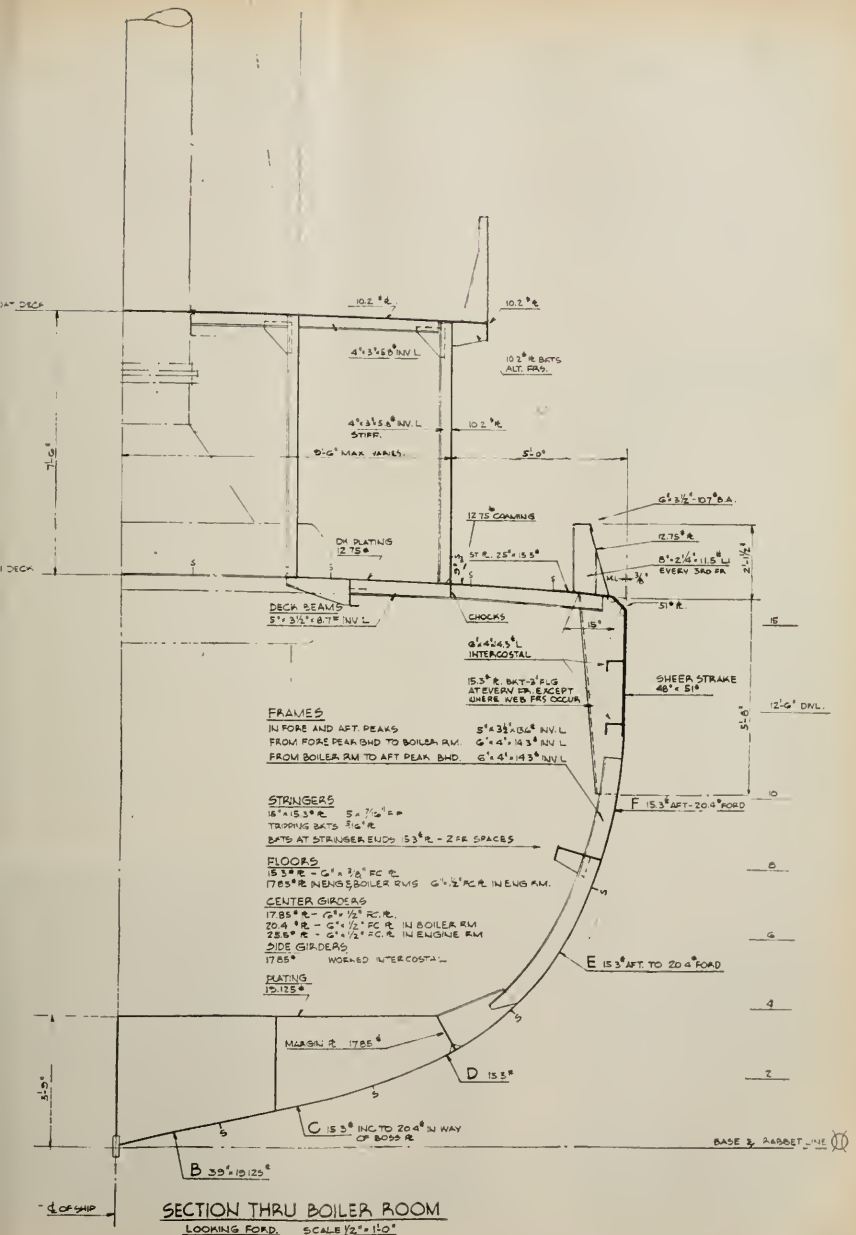
Feed water pump discharge is also used as the source of supply for back washing the Permutit oil removal filter and as motive power of a Wallace and Tiernan water motor which drives the chemical feeders for the oil removal filter and a water motor driving the chemical mixing tank agitator. The discharges of these water motors are returned to the feed and filter tanks.

Power for lighting is furnished by a 7½-kw Westinghouse turbo-generator. The condensate pump also is turbine driven. Both of these auxiliary turbines use same steam conditions as the main engine.

The boiler is equipped with a Wing steam turbine driven forced draft blower operating on 150 psi desuperheated steam.

All auxiliary pumps, such as fire pump, general service pump, bilge pump, sanitary pump, fresh water pump, and boiler feed pumps are duplex steam driven pumps furnished by Worthington Pump & Machinery Corp., who also furnished the vertical steam engine driven centrifugal circulating pump.

The steering engine is a 4½" x 5" steam driven unit operated mechanically from the pilot house and after steering station. This unit is furnished by Markey Machinery Company of Seattle, which firm also supplied the deck machinery for the ship, consisting of the following: a combination 6" x 6" two-cylinder steam windlass and warping winch located forward for raising and lowering the anchor and for handling the warping lines; a 7" x 8" two-cylinder steam engine driven capstan; and a 10" x 10" two-cylinder steam towing engine aft capable of exerting a pull of 30,000 pounds. All of the auxiliaries, except as otherwise specified, are operated on desuperheated steam at 150 psi.

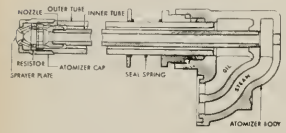


SECTION THRU BOILER ROOM

LOOKING FORD. SCALE ½" = 1'-0"

Efficient, Economical Marine Boiler

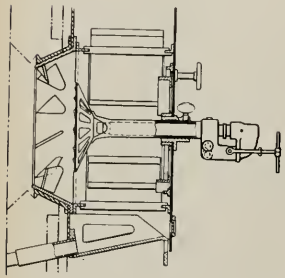
The new Santa Fe harbor tug Edward J. Engel is equipped with a Babcock & Wilcox single-pass header-type boiler, a design that was developed by The Babcock & Wilcox Company and has been very popular not only for tugboat installations but for a large percentage of our modern merchant ships.

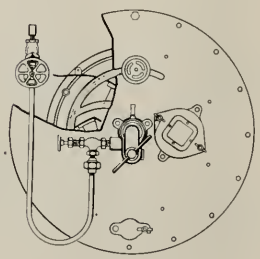


For tugboat service, where all dependence is placed on one boiler, it is essential that inspection and maintenance be done in minimum time in order not to delay the vessel. With the header-type boiler, all tubes are straight and readily accessible from outside the boiler without waiting for the unit to cool. This is a very valuable time-saving feature in case emergency repairs, such as the plugging of a tube, are necessary. The gases of combustion make a single pass through the tube bank, and there are no baffles or pockets to collect soot. An installation of Diamond Power Specialty Corporation soot blower assists in keeping the external heating surfaces clean.

The boiler in the Engel has 313 sq. ft. of heating surface and is designed to generate 19,540 lb. of steam at the normal rating and 22,800 lb at the overload rating. The boiler is fitted with a superheater which heats the steam to a total temperature of 500 F., the steam leaving the superheater at a pressure of 200 psi gage.

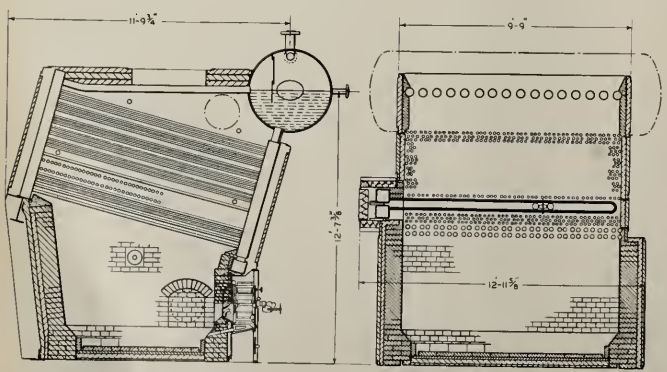
The boiler is equipped with two Babcock & Wilcox wide-range Y-jet steam-atomizing oil burners. An operating range of approximately twenty to one may be obtained without changing sprayer plates. Although steam is used for atomization, the quantity required is very small, being less than 1 per cent at the normal rating. The oil burners are mounted in a wind box in the furnace front in which is also mounted an L. J. Wing Mfg. Co. forced-draft blower.





Although wide-range oil burners have been installed in many of our ocean-going vessels, this is one of few tugboats having this type of installation. The use of this type of burner permits the operators to take full advantage of the ability of the Babcock & Wilcox single-pass boiler to respond quickly to sudden load changes that are encountered in tugboat service.

The flow of feedwater to the boiler is controlled by a Bailey thermo-hydraulic feedwater regulator.



SECTIONAL SIDE ELEVATION OF BOILER

SECTIONAL FRONT ELEVATION OF BOILER

Top of page: B & W wide-range Y-jet atomizer. Atomizers of this type are installed in the Engel.

Center: B & W Decagon oil burner with wide-range Y-jet atomizer.

Bottom: B & W single-pass boiler installed in the Engel.

The Future of Concrete Shipbuilding

We have frequently published and will publish again articles advocating the special design of hull structures so as to take advantage of all the benefits to be derived from welding. This article is a plea for more extended research into the special design of certain types of hull structure to take full advantage of the properties of reinforced concrete construction.—[Ed.]

By Mario Palmieri
Naval Architect

IT IS THE PURPOSE this article to show that the progressively-minded naval architect should prepare himself for the task of evolving designs adequate to the characteristics and the possibilities of concrete as a material of ship construction.

First Concrete Hull

It is well to remember that the very first use of reinforced concrete as a structure built entirely of this type of material was not in civil construction but in boat building.

In 1849 a reinforced concrete boat was built by a Frenchman by the name of Lambot and exhibited at the Paris World Fair of 1855. This boat, which utilized a framework of rods embedded in a shell of concrete, had a varied life and was still in use as late as 1903. Considering the small knowledge of the properties of reinforced concrete and the crude technique for its use that existed in 1849, Mr. Lambot achieved a remarkable result.



Mario Palmieri

Problems Involved

The problem of building a satisfactory concrete ship has three aspects: first, the over-all cost; second, the economic returns per ton of displacement; and third, the life expectancy of its earning capacity.

The satisfactory solution of these three aspects hinges in turn upon the right solution of the fourfold problem of concrete ship design: form of hull; structural strength of hull; design of concrete mix; and method of applying the same.

A concrete ship may be an utter failure if either the design of the concrete mix or the method of application of same is faulty, no matter how satisfactory may have been its design both as to form and as to structural strength.

It is well to emphasize the importance of each one of the four basic elements of design because naval architects are apt to dismiss the last two as secondary.

Form of Hull

An effort should be made to visualize the form of the hull in terms of simple geometric surfaces. Simplified shapes eliminating surfaces of double curvature may be designed in a way that will guarantee the minimum resistance. A beginning was made during the last war with the building of the concrete steamship Faith on extremely simplified lines. What is needed is a carefully planned program of investigation, with compilation and interpretation of the results—an interesting problem for any experimental tank.

The element of form is connected intimately with those three characteristics of a ship which are of greatest importance to the ship operator, viz. the gross tonnage, the net tonnage and the deadweight carrying capacity expressed as functions of the ship displacement.

Actual facts, for ships as built now, prove that for equal d.w. carrying capacity the concrete ship needs to displace 1.4 times the displacement of the corresponding steel ship. But, in the last analysis, because propulsive power varies approximately as the 2/3 power of displacement and the cost of fuel is only about 15 per cent of the total operating charges, the increase in operating charges for the concrete ship amounts to only four per cent, an increase which may be more than offset by the saving in painting and scraping charges.

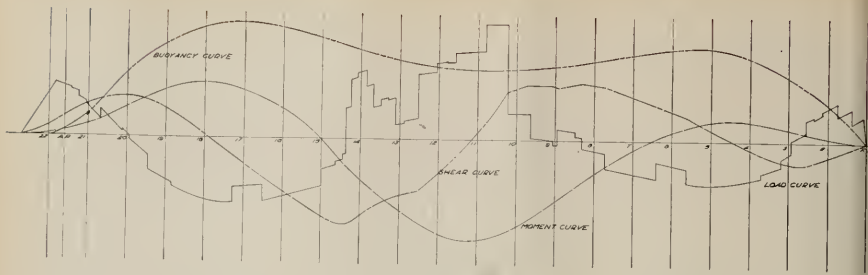
However, concrete ships, as built now, have not yet utilized all the saving in weight that can be brought about by a rational reinforced concrete ship design.

Structural Strength

Congruency should exist between a material of construction and the characteristics of the structural design which is evolved to utilize that particular material to the best possible advantage.

Such congruency has always existed between wood or steel as materials of ship construction and the structural designs of the wood or steel ships. Advances may be made, and will be made, which will utilize more fully and adequately the properties of the various types of steel alloys and light metals.

Analogously, in the case of wood,



STRUCTURAL DESIGN CURVES FOR 3300-TON CONCRETE SHIP

unless a sweeping reform of the basic principles of wood design originates from the adoption of lamination on a wide scale, there is very little reason to offer any radical criticism of the framework of wood ships as it has been evolved through the ages.

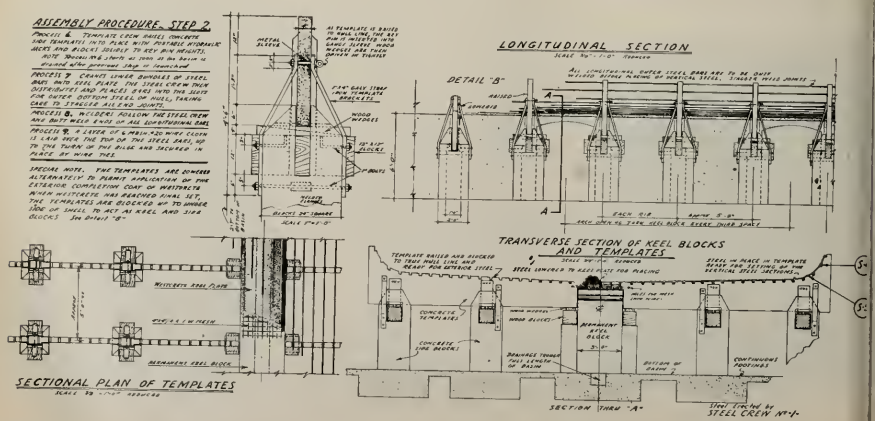
In the case of concrete, however, the naval architect of the years 1914-18 used in a practically integral, summary way the type of structural design and the methods of construction inherent to civil engineering buildings. Faced with the urgency of the issue he was, in a way, justified to adopt such a procedure.

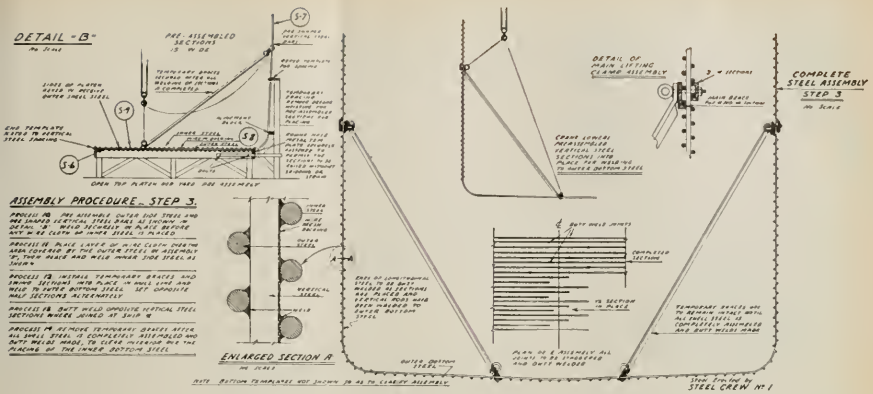
However, in 1945, 25 years later, this same procedure is being advocated, and the vast progress in the art of shipbuilding, in the science of structural design and in the technique of concrete making has not been used by the naval architect of today.

A true beginning in the rational structural design for reinforced concrete ships was made with 25 lighters built at the National City yard in 1944. The hulls of these lighters were unencumbered with ribs, beams, frames, columns, pilasters or struts. Shell sides, bottom, deck and bulkheads were flat slabs completely unrelieved except for haunches at the connections at the corners. The shell sides were only eight inches thick, the bottom nine, the deck seven, and the bulkheads six and one-half. As Mr. Tuthill of the U. S. Maritime Commission remarks: " . . . with straight slab construction of these thicknesses, absence of ribs and beams, and with the reinforcing steel spaced to allow general access for the internal vibrators, these hulls were designed for efficient concrete construction. One of them was actually built and launched in six and a hal days."

Because of the fact that concrete can be shaped at will throughout the breadth and length of a structure material can be provided in accordance with the need. Gone is the time when we must have ribs and shell when, by diminishing the spacing of the ribs to zero, we obtain shell sides made out of what one can call at will one continuous rib or one continuous slab. Gone is the fear that every member must take care of the stresses set up in it, because of the difficulty inherent in the realization of a true continuity of the structural framework, when we can at last realize in effect a true monolithic structure in which every part is called to help the contiguous one, because there exists an integral interdependence of all the parts.

Ship design has been based upon



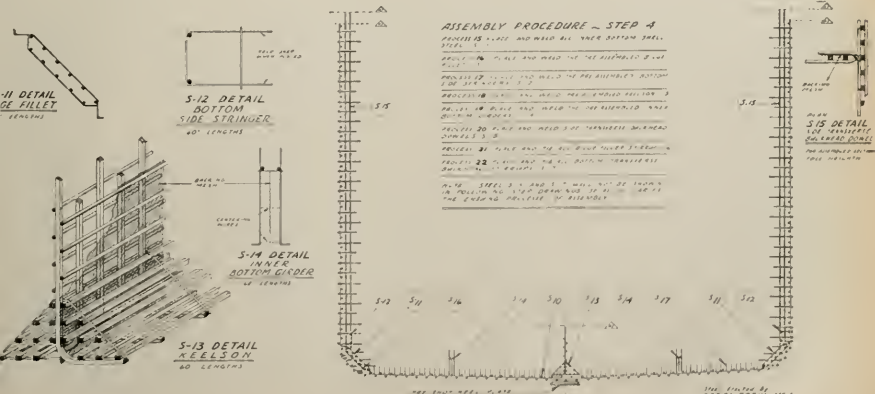


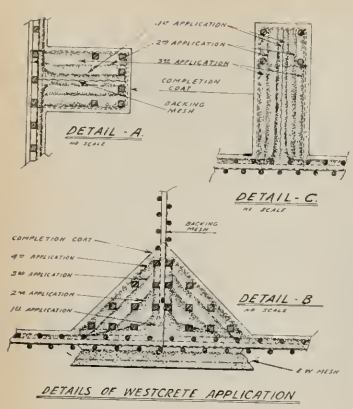
the time-hallowed principle that the transverse strength is to be supplied by a system of closely space transverse frames or widely spaced transverse frames interconnected by continuous closely spaced longitudinal stringers, while the longitudinal strength is to be supplied by the ship as a whole, acting as a box girder. In this type of design the shell has mainly the function of transmitting the effects of local loads to the framework of the ship, and torsional stresses are taken care of mainly by decks and bottom. In the type of structural design proposed for concrete ships, the shell, together with the system of transverse bulkheads, would take care of lateral loads and the torsional stresses in their entirety, while the longitudinal bulkheads, monolithic with deck and bottom, will form girders to take care of longitudinal bending stresses. Thus every part of the ship structure will fulfill a functional purpose and the whole framework will be the outcome of its conception in terms of reinforced concrete material rather than wood or steel.

Earning capacity of a ship depends upon its d.w. carrying capacity. The greater the percentage of d.w. that can be carried for a certain displacement, the greater the earning capacity. Now, if this rational structural design can bring about 20 per cent reduction in the weight of the hull, the differential in weight between a steel vessel and a concrete one will become practically negligible. Such a reduction from prevailing weights may be realized by careful revision of existing designs taking advantage of all the possible factors of reduction of which we can avail ourselves at present.

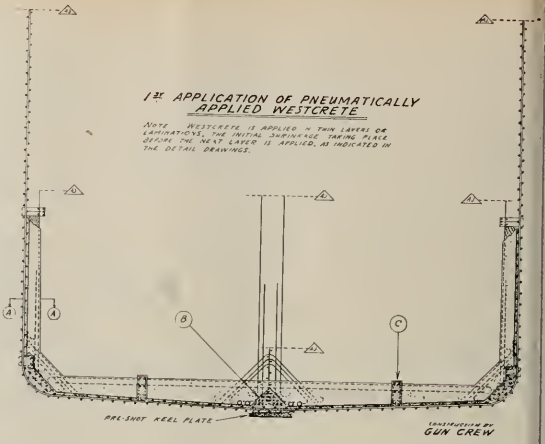
Concrete Mix

Structural design is based upon certain ultimate strength of the concrete mix. This in turn depends on the character of the mix. Form, and its implied aspects of buoyancy, draft, and freeboard, in the lightship condition depend almost exclusively on the weight of the hull, which in turn





DETAILS OF WESTCRETE APPLICATION

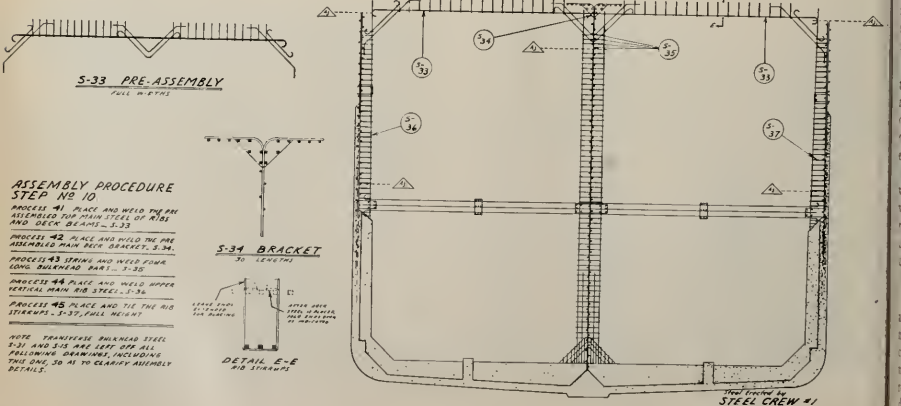


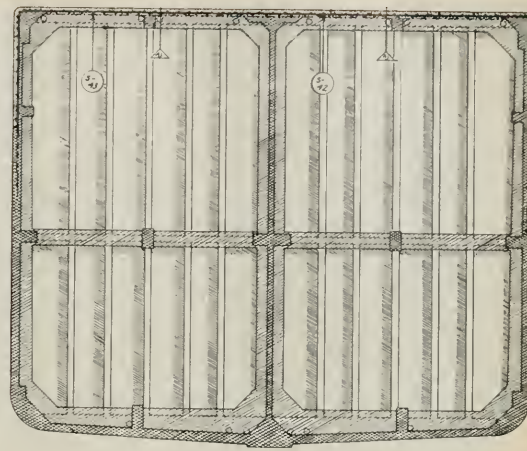
depends on the type of mix used. A mix using lightweight aggregate may weigh only 70 to 75 per cent of a mix of equal water-cement ratio using standard type aggregates.

For ship hulls a concrete mix ought to have a maximum ultimate unit compressive strength. This can be brought about either by increasing the cement content (in some yards the cement content approached nine sacks per cubic yard) or by modifying the chemical structure of Portland cement. Portland cement is a mixture of chemical compounds originating from the reaction of lime, silica, alumina and iron at the clinkering temperatures used.

By varying the percentages of the primary substances, the catalysts employed, the clinkering temperatures and the grinding process, we can alter the characteristics of the finished product. The type of Portland cement to be used in concrete ships should be produced specifically for the conditions which it must meet. One, especially, among these conditions is the resistance of the concrete to the destructive action of sea water.

It is a well-known fact that the calcium silicate compounds forming the matrix of the concrete are essentially unstable and that they liberate, during the process of hydration, a progressively higher amount of lime, teding to revert to compounds of lower lime content, and, ultimately, to pure lime and silica. This is a remarkably slow process, and, in ordinary cases, does not affect the life of ordinary structures. When the free lime comes in contact with the sulfates contained in the sea water, trouble begins. These sulfates have great affinity for combining with lime to form calcium sulfates wherever the structure of the concrete is por-





ous enough to allow the formation of crystals of this material. A highly impermeable and dense concrete mix is therefore necessary. This type of mix comes from a combination of three factors: the quantity and quality of the cement; the introduction of mechanical vibrators; and the addition of admixtures.

Much work has been done on admixtures and much more remains to be done, especially in connection with so-called pozzolanic admixtures which combine with lime to form compounds chemically stable in sea water.

All these features of the right type of concrete mix for concrete ships must be thoroughly investigated and solved before the right type of concrete ship can be built.

The remaining feature of the mix, the selection of the proper aggregate, must be thought of always in terms of weight, primarily because every ounce of weight saved means added economic return. The concrete ship of the future will be built with lightweight aggregates. If natural lightweight aggregates cannot be found, processes must be developed to manufacture them as has already been done in the case of the San Francisco-Oakland Bay bridge.

What the naval architect needs is a mix which will produce, with the minimum amount of cement, a concrete: of the highest possible ultimate compressive strength; of a reasonable tensile strength; highly dense; as light as possible; of minimum characteristic of expansion or contraction; and of maximum resistance to the action of sea water. This is, to say the least, quite an order for the concrete technicians to fulfill, but they work miracles for shoreside structures; why not also in ships?

Application Technique

The time would seem to be ripe for the adoption on a large scale of pneumatically applied concrete. The process of setting up, and dismantling afterwards, the two sets of forms which have been in use generally when concrete has been poured is a great waste of time. With the new types of pneumatically applied concrete now developed, it is possible to use a reinforcing steel framework with a central layer of added wire mesh as background against which to shoot the concrete mix, eliminating forms altogether.

Furthermore, by applying the concrete in successive layers, after each one has taken its initial set, but making sure that they bond integrally to each other, it will be possible to reduce shrinkage cracks to a minimum, and their cumulative effect becomes practically negligible inasmuch as no two cracks will ever be in exact correspondence in the same section. But, perhaps, the greatest advantage of this method of applying a concrete mix is that, being able to shoot the pressurized concrete in successive layers, it is also possible to split the whole assembly of reinforcing steel in subassemblies which can be progressively integrated as the various layers are being deposited, until the whole vessel can be said to have been built through a progressive and perfectly integrated series of steps leading to final completion.

The remarkable elasticity with which this method of construction can be adapted to all types of vessels makes it an ideal tool for rapid and efficient ship construction.

Our illustrations show some of the steps in this method of construction for a typical concrete barge, U. S. M. C. Design B7-A2. These drawings show the trade name "Westcrete," a rather successful example of pneumatically applied concrete. Gunite or other trade name would serve the purpose just as well.

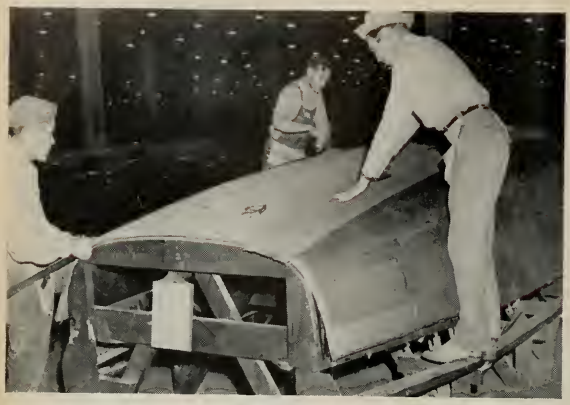
Summary

This exposition of methods of construction of a hypothetical concrete vessel is to be taken only as an illustration of the possibilities inherent in pneumatically applied concrete, and not as the final word on the subject.

Summarizing now all that has been said above in a few final paragraphs we may state that the concrete ship of the future will be an entirely different structure from the present typical hull because:

(1) Its structural design does not need to follow the structural design of steel ships.

(Page 364, please)



The final layer of birch veneer is fitted to hull. The entire assembly is next encased in a rubber bag and then placed in an autoclave, where steam supplies both heat and pressure to cure the resin glue. Only .600 inches thick, the hull is exceptionally rigid and strong.

Airborne Rescue Boat Construction

A phenol formaldehyde resin adhesive, Amberlite PR-14, provides waterproofness and high strength plywood bonds for the new airborne rescue boat recently developed by the Higgins Plastics Corporation, New Orleans, La. This resin, a dry powder, is produced by the Resinous Products & Chemical Company and possesses an unusual balance of long flow at moderate temperatures with short curing times at higher temperatures—a necessary combination for the bag molding process used in the construction of the boat hull.

Higgins engineers designed a molded plywood hull that could be fitted under the massive undercarriage of Flying Fortresses. It was 27 feet long, nearly eight feet wide, and weighed 3100 pounds when completely outfitted, yet the design was such that the airspeed of a plane loaded with the boat was reduced only eight miles per hour. The hull was 0.6 inch thick, composed of eight .075 inch veneers. It was found that birch faces and backs gave the highest impact resistance. The hull is molded in one piece and is believed to be the largest molded plywood section in production.

In the bag molding where compound curvatures are readily formed, the choice of an adhesive is vitally important. Heat is usually applied through the medium of steam, and the whole assembly cannot be brought to a uniform heat simultaneously. This uneven heat penetration causes the glue in the joints nearest the heat source to reach a state of flow and possible polymerization before the reactions occur in the inner glue lines. Since inner glue line temperatures are raised slowly, an excessively long flow period sometimes results in migration of the adhesive from the bonding area and consequent danger of "starved joints."

The moisture content of the veneers affects the flow of the adhesive, with low moisture content being preferred since it reduces the migration of the adhesive from the glue line. Due to the large size of the molded hull of the rescue boat and the thickness of the assembly, veneer moisture content was reduced to a range of from seven to eleven per cent in a drier before spreading with Amberlite PR-14.

In bag molding the rescue boat, the veneers, long and relatively narrow strips, are spread with Amberlite PR-14 at the rate of 25 to 30 pounds per 1000 square feet and then laid upon the mold with the grain of the veneers at opposed directions to give maximum resistance to splitting and to improve dimensional stability. Since Amberlite PR-14 allows the veneers to be spread and dried before placing on the mold, the lay up of the assembly is greatly simplified. After positioning on the mold, the veneers are lightly tacked in place and then the whole assembly is covered with a rubber bag and placed in an autoclave, where steam supplies both the bonding heat and pressure. During bonding, under the pressure and heat of the steam, the veneers slip into close contact and conform to the shape of the mold. Here again it is important that the flow period of the adhesive be sufficiently prolonged to permit the veneers to reach their final conformation before the cure of the resin is completed. Amberlite PR-14 answers this requirement completely.

Bonding the eight .075 inch veneers composing the hull of the rescue boat requires about one hour at 75 pounds steam pressure, which is roughly equivalent to 320 degrees F.

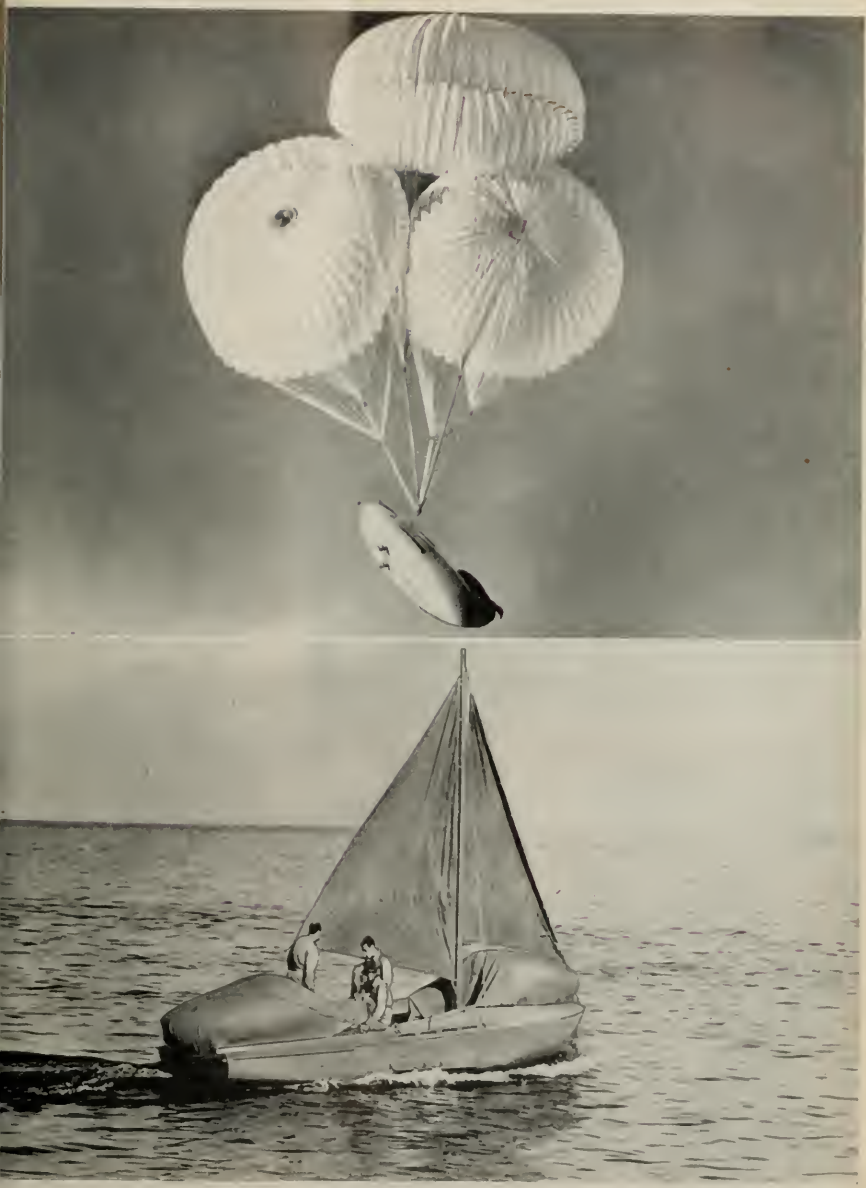
The increasing range of our fighting planes brought with it problems of how to rescue pilots forced down when planes are damaged during combat far at sea. While rubber boats of the self-inflatable type have been responsible for saving many lives, they are not designed for the voyages of 1000 miles or more which may be necessary in the far reaches of the Pacific or Atlantic. In addition, their limited carrying capacity and lack of adequate shelter make it impossible to tend the wounded or to weather sudden storms. Upon many occasions, rescue planes are forced to watch crews of lost aircraft tossing on the water because it is too

(Page 364, please)

ON FACING PAGE:

Top: Careful estimation of the drift caused by wind and current is required to land the boat near the sea-tossed survivors. The boat is balanced to land bow first.

Bottom: Higgins air rescue boat in water after survivors have been picked up.



Post-War Merchant Marine

(Continued from page 313)

ships are concerned to a consideration of the standard C-type fast cargo carriers. We do not have the figures as to the exact number of C-type cargo vessels built in 1943 that were converted to military use as: destroyer and sub-tenders; escort airplane carriers; evacuation and hospital craft; floating machine shops; and other auxiliaries.

The extent to which such carriers were converted to military uses is evident in the case of the "Victory" type cargo carrier. Of 244 fast "Victory" freighters built by Pacific Coast shipyards in the 1943-44 period, only 95, or 38 per cent, were finished as commercial cargo carriers.

If we take the 1943 percentages as typical, and apply to the grand total of our merchant fleet as published by the U.S.M.C. the 11 per-cent figure, we find that we will not have at the close of this war any surplus of fast modern cargo ships with which to "capture the world's trade."

The published figures relating to this grand total of tonnage vary considerably. Admiral Land's latest figures approximate 60,000,000 d.w.t. as total available. Applying our percentage figure, the tonnage of modern fast cargo vessels ready to go to sea on commercial business would be 6,600,000 d.w.t.

We admit that this is a very rough analysis and that the resultant figure is probably way out of line, but there is sufficient truth in the figures to suggest several conclusions.

(1) That disposal of the Liberty type fleet by sale and/or an intelligent scrap program would do away with 50 per cent of our post-war tonnage problem.

(2) That immobilizing the military types takes out another 25 per cent.

(3) That the total remaining fleet of fast modern cargo vessels can be readily absorbed by the normal expected business of America's overseas merchant marine.

(4) That this fleet will have to be supplemented by the building of a considerable fleet of special types such as passenger and passenger-cargo liners.

It seems to us that the Maritime Commission and the War Shipping Board should publish an accurate breakdown of figures covering the total fleet built and building. This breakdown should show: the number and tonnage of the various types; the number of each type converted to military use; the number of each type lend-leased to other nations; the number of each type sunk by submarine or by sea peril; and most particularly, the number of each fast modern cargo type that will be available for American commerce without reconditioning or conversion work.

There is much propaganda out of Washington urging the American people to consider the problem, "What shall we do with our huge merchant fleet?" If that part of the merchant fleet useful for competition is no larger than indicated by this rough analysis of ours then the problem would seem to consist solely in adopting a commercially sensible plan for selling these vessels to American shipowners.

MARITIME DAY, SAN FRANCISCO, MAY 24, 1945

Above: Rear Admiral Edward Macauley, U.S.N. (ret.), tosses floral wreath on the waters of the Golden Gate honoring the memory of the over 6000 American merchant seamen who have given their lives during the war.

Below: On Golden Gate Bridge, San Francisco, colors are dipped for the merchant mariners who have died in performance of duty during the war period.





Pacific World Trade



By T. Douglas MacMullen

CHINATOWNS—
Let's Keep Them

The word "infiltration" has come to have a special meaning in this war and it connotes a process that is distasteful to Americans. So it is with no reflection on American-Japanese that we express the hope that means will be found for discouraging their return to the Chinatowns of the West, especially to San Francisco's Chinatown.

From the earliest days of San Francisco's colorful history, the Chinese have been an important group, contributing a great deal to the city's welfare and attractiveness. In another article in this issue, the future of trade relations with China is discussed. Important to this future is the future of the Chinese in San Francisco. They are an industrious and ambitious group, contributing at least their share in every civic movement and in every phase of the war program without in any way interfering with others.



It was with dismay, therefore, if not with alarm, that the city came to realize that the Japanese had infiltrated among them, controlling business properties, operating many stores and dwelling places, substituting Japanese for Chinese merchandise on the shelves, and forcing the Chinese to adopt minor defensive tactics in their own district.

Trade with China is going to be an important element in our future economy, and every outlet for China's goods will be worth cultivating. Chinatown itself is important, and for several reasons. The Chinese people are important to the city. Their business is important and due to become more so. But the institution we call Chinatown has a value in the foreign trade world that creates business for the city. This value is its attraction to tourists. Tourists mean dollars to steamship companies, hotels, cafes, theaters, cab companies, and directly or indirectly to the entire city.

Chinatown is an institution that should not be undermined, as it was before the war, by Japanese encroachment, and as it seems about to be again.

If there is a way to prevent a future unwholesome development, without interfering with the rights of others, it should be done now.

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Rubber 342

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JULY

Export Possibilities
By E. E. Callahan, Vice President, International General Electric
Financial Resources for World Trade
By E. Leuenberger, Assistant Vice President, Wells Fargo Bank & Union Trust Co.
Peru
Bananas
A Smudge on the Picture

"THIS CENTURY WILL BE THE CENTURY OF THE PACIFIC."
—*Theodore Roosevelt.*

"THE CENTURY OF THE PACIFIC IS HERE."
—*T. V. Soong.*

Air Rights for Shipping Are Still A Big Issue

By Albert V. Moore

President Moore-McCormack Lines, Inc.



Albert V. Moore
President Moore-McCormack Lines, Inc.

Victory in Europe and the advance of our forces in the Pacific provide compelling testimony to our ability to deliver the goods to far places and under trying circumstances.

At this time, this elation must be tempered by a sobering thought. Victory in Europe brings the realization that the maritime problems which will arise with the ending of the war are not academic ones. As the whole focus of the war shifts to the Pacific, as the nations of Europe seek to re-establish some sort of working society and working economy, we will see—even before the end of the war—developments taking shape which must be met. The time has come—it is here right now—for a resolution of the many questions we have been debating ever since we realized how great our merchant fleet was becoming.

Big Job Ahead

It is, of course, obvious that for months to come our merchant ships will have tremendous jobs to do in the Atlantic. Millions of troops with their material must be returned or transshipped direct to the other side of the world. Food, clothing, relief supplies of all kinds must be delivered to the suffering peoples of Europe. Building supplies, farm machinery and industrial equipment must be provided so that they can reconstruct their economic systems—so that they can start housing themselves, clothing themselves, earning their livings once again.

Slowly, the pattern of shipping activities in the Atlantic will lose its warlike tone, regardless of the continuance of the struggle in the Pacific. More and more, the goods handled will be the goods of peace, and such passengers as may be carried will be concerned with the tasks of peace.

Somewhere along this progressive way lies the opportunity for identifying once again the various American shipping services with the trade routes they have built up. This does

(Continued on page 344)

This is a scale model of the giant 204-passenger Consolidated Vultee airplane, a fleet of which Pan American World Airways ordered for post-war service.



Pacific WORLD TRADE

How Banks Can Aid Foreign Trade Revival

By Elliott McAllister
Vice President, The Bank of California.



Elliott McAllister

When foreign trade revives after the war, it will bring a host of new problems in marketing and financing. For the war in the Pacific, and the Far East in particular, has resulted in filling in what were formerly numerous blank spaces on the map. In dealing with many of these new trade situations the understanding banker can aid in finding the solution through his knowledge of foreign trade procedure and background of wide experience.

Here on the Pacific Coast foreign trade began shortly after the California Gold Rush days and closely parallels the growth of our port cities. Its Coastwide development can easily be traced through the records of transactions passing through this bank for more than 80 years, and we believe that we are operating one of the oldest, if not the oldest, foreign departments in the country.

Its foreign trade activities go back to the founding of the Bank of California, for when it was organized in 1864 a large part of its business was the financing of export shipments of grain to the United Kingdom. (Another historical link is that this bank stems directly from a private banking firm founded in 1855, whose four partners started a shipping line in 1852 to serve the tremendous migration of people coming Westward.)

The bank's first advertisement, dated June 18, 1864, read in part: "The above named corporation has been organized for the purpose of carrying on the Banking and Exchange business . . . in the neighboring State and Territories, and with Mexico; also with the Atlantic Cities, Europe, China, and the East Indies." From that time on the bank shipped to or received from abroad gold and bullion and engaged in an extensive exchange business, particularly with the Orient and with Central and South America.

In 1866, two years after the bank was incorporated in its present form, the first steamship line to the Hawaiian Islands began operation; and the year after that, regular sailings began between San Francisco and Alaska. Other records show various transactions made in encouraging commerce with Alaska before that territory was purchased from Russia by the U. S.

Before me as this is written is an insurance policy which shows that our bank was financing a shipment of whale oil from San Francisco to Hong Kong, made before the invention of the electric lamp or the export of petroleum products. In 1867 the Pacific Mail Steamship Co. opened the China trade with the side-wheeler Colorado, sailing from San Francisco to Hong Kong on January 1 with 1,000 barrels of flour and $560,000 in specie. Support was given by the bank to the development of transpacific ocean traffic that laid the foundation for the great Oriental trade which has since been a potent factor in the business of Pacific Coast ports.

Turning the ledger pages we find that in the sixties and seventies the San Joaquin and Sacramento Valleys raised large crops of wheat and other grains, much of which was shipped to world markets by the "grain ships" which loaded at Port Costa. In 1874 Dr. Hugh James Glenn of Glenn County — then the "Wheat King" of California—sold the yield from 41,000 acres of wheat at his San Jacinto ranch to European buyers.

During the seventies the lumber mills and fisheries of the Pacific Northwest, citrus fruit-growing in Southern California, the continued development of sheep and cattle raising, the rise of the grape and fruit industries — all these and a dozen more joined the increasing stream of foreign commerce. In the early eighties wheat-growing on a large scale on the ranches of Oregon and

The bank's San Francisco headquarters in 1864.



Washington, followed later by distinctive types of apples raised in the Hood River, Wenatchee and Yakima Valleys, added to the wealth of the Northwest and reached additional world markets.

Before World War II began, this bank was financing for export a wide variety of commodities, including Northwestern wheat and California barley to the United Kingdom; lumber to South Africa; canned salmon to the Far East and to Europe; apples, prunes and other dried fruits to Europe; canned goods to Europe and the Orient. Out of San Francisco export transactions financed covered many supplies used in the islands of the Pacific—Tahiti, New Calcdonia, the Fijis and the Philippines.

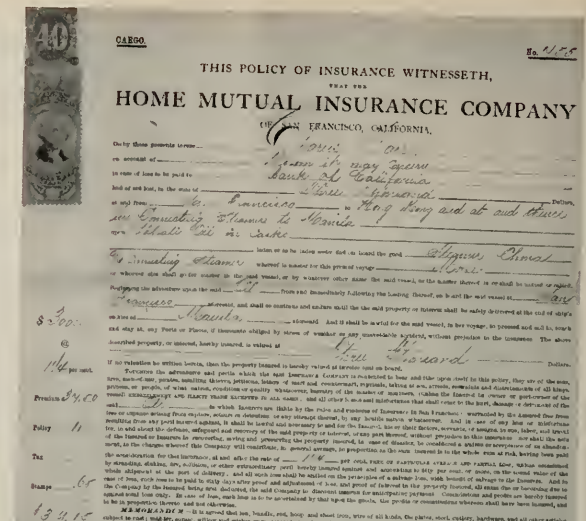
Foreign trade is not a one-way street. In return jute and sugar bags came from India; tung oil from China, silk from Japan; copra from the South Seas; tin and rubber from the Malay Peninsula; rubber, tin and spices from the Netherlands Indies; vanilla beans for America's desserts from Tahiti and cloves from Madagascar.

During the war the traditional trade routes have been severed with enemy countries but continued between Allied nations and neutrals. Privately financed foreign trade has developed new and larger opportunities, especially in Latin America and the Caribbean area. New banana plantations are being started on the West Coast of Central America. These Latin-American countries are alert to post-war commercial and industrial opportunities for trade with this country. The growing Mexican handicraft industry is an example of the new opportunities which have grown out of wartime conditions.

After the war foreign trade on the Pacific Coast will show a large increase for some years. All the foodstuffs we can spare will be in immediate demand. Huge quantities of supplies will be needed for rehabilitation of devastated areas.

The mines, plantations and industries of the Philippines have been plundered by the enemy and will require the installation of new equipment. The oil fields and refineries of Borneo, Netherlands Indies and Burma will have to be reconstructed.

There will be the tremendous task of rebuilding the business and residential areas of Manila, Singapore and other bombed cities in the Far East. Manila is reported to have a 15-year rebuilding program planned. Much of the structural steel, cement and other building materials will be shipped from Pacific Coast ports.



CARGO. No. 4575

THIS POLICY OF INSURANCE WITNESSETH,

THAT THE

HOME MUTUAL INSURANCE COMPANY

OF SAN FRANCISCO, CALIFORNIA.

Insurance policy covering an early-day shipment of whale oil to Manila via Hongkong. The beneficiary was the Bank of California.

According to refugees, the Japs have stripped the foreign settlements of Shanghai and Hong Kong of electric fixtures, machinery, plumbing, wiring, pipe, bathtubs and home furnishings for shipment to Japan. Before business establishments and residences still standing in those cities can be used again they will have to be equipped with new furnishings and fixtures. In those cities which have experienced bombings the public transportation facilities must be replaced. Bridges, railway lines and terminals will have to be rebuilt.

There will probably be some trade between governments, similar to the government financing corporation formed for importation of copra. Government financing will probably also be arranged for shipment of tungsten and tung oil from China. That country is reported to have an ambitious post-war expansion program covering industries, roads and railways which may require 25 or 30 years for completion.

We can also look for increased trade relations with the Netherlands Indies, not only to repair the damages of war, but for commercial development in the future. Although

THE BANK OF CALIFORNIA.

INCORPORATED UNDER THE LAWS OF THE STATE.

Capital Stock, (*Paid up in Gold Coin,*) $2,000,000.

WITH THE PRIVILEGE OF INCREASING TO

$5,000,000.

STOCKHOLDERS.

SAN FRANCISCO.

D. O MILLS,
WM C RALSTON,
R S FRETZ,
J. B THOMAS,
LOUIS McLANE,
ASA T. LAWTON,
WM. E BARRON,

THOS BELL,
JNO O EARL,
WM NORRIS,
J WHITNEY, Jn.,
O F GIFFIN,
A J POPE,

HERMAN MICHELS,
FREDERICK BILLINGS,
GEORGE H HOWARD,
H F TESCHEMACHER.
A HAYWARD,
MOSES ELLIS,

A B. McCREARY,
R M JESSUP,
SAMUEL KNIGHT,
A C. HENRY,
J C WILMERDING,
WM ALVORD

PORTLAND, OREGON.

JACOB KAMM.

D. O. MILLS, President. **WM. C. RALSTON, Cashier.**

Correspondents in New York, LEES & WALLER, No. 33 Pine Street.

in London, BANK OF LONDON.

The undersigned give notice that the above named corporation has been organized for the purpose of carrying on the Banking and Exchange Business, in all its branches, in this City and with the interior of this State, the neighboring State and Territories, and with Mexico; also with the Atlantic Cities, Europe, China, and the East Indies; for which they are provided with ample facilities, and in conformity with articles of Association will commence operations on the 5th day of July next, at the Banking House now occupied by DONOHOE, RALSTON & Co., Corner of Washington and Battery Streets.

With the view of giving to the business of the corporation all the efficiency and promptitude of a private banking firm, together with that confidential seclusion of private business matters so generally desired, the immediate management of its affairs is committed exclusively to D. O. MILLS and WM. C. RALSTON, as President and Cashier respectively, to whom, or either of them, the customers of the Bank will apply in all business matters. The regular meetings of the Board of Trustees will take place monthly.

The undersigned deem it advisable to call particular attention to the following peculiarities of their organization, which are positively binding on all its members:

First.—Sales of its Capital Stock can be effected only after due appraisement by Stockholders elected for that special purpose; and the Trustees of the corporation have, in all cases, the right to become purchasers of the Stock appraised at the appraisement, for the benefit of the remaining Stockholders. This restriction is printed upon each Certificate of Stock.

Second.—Loans cannot be made to Stockholders, except upon collaterals other than their Shares in the Capital Stock of this Bank.

D. O. MILLS,	HERMAN MICHELS,	A. J. POPE,	TRUSTEES.
LOUIS McLANE,	W. C. RALSTON,	O. F. GIFFIN,	
WM. NORRIS,	J. B. THOMAS,	JAS. WHITNEY, JR.	
JNO. O. EARL,	THOS. BELL,		

SAN FRANCISCO, June, 18th, 1864.

Newspaper advertisement offering stock in the new bank. Note that a major objective was trade with "Mexico, Europe, China and the East Indies."

ustralia formerly traded largely ith Great Britain, its people have own great interest in new products troduced by American services rces stationed Down Under. Many merican firms will open branches in ustralia.

Large undeveloped island areas ke New Guinea and Borneo have en found during service by Allied rces to have new possibilities for mmerce and settlement. The use DDT insecticide will make many opical areas more livable and new arkets will be established for air nditioning, refrigeration, radio uipment, wonder-working sulfa ugs and penicillin.

The revival of business in China d the Philippines, the supply of r and Navy bases in the Pacific, the ade expansion which will undoubtly follow the millions of soldiers d sailors introducing American goods throughout the Pacific theater of war—all these mean new foreign trade opportunities for the Pacific Coast.

A well-known banker once asserted that commercial geography is the most essential part of an international banker's education, for he must know the local markets not only as to credits, money, politics and native characteristics, but also as to climate, rainfall, crops and communications. This is particularly true for the banker dealing with foreign trade in the far reaches of the Pacific and the Far East.

A classic example of this lack of understanding is that of the American breakfast cereal manufacturer who, having built up a big demand for his product in this country, decided to invade the European market. France was selected as having good possibilities, because the French people as a rule do not eat the typical American hearty breakfast. Considerable money was spent on a promotion campaign, only to discover that the French didn't care to switch to his vitamin-building morning cereal. They preferred to stick to their traditional black coffee and crusty rolls.

The understanding banker can help his customers in many ways, especially in giving them the benefit of his experience in handling many other trade transactions. Here we maintain up-to-date information covering countries all over the world. Through these connections and our own correspondents our foreign exchange procedure is kept current. Credit information can be provided. We help customers prepare their shipping documents. Their documentary bills can be discounted. Funds can be provided under letters of credit for traveling in foreign countries, letters of introduction given.

Another important factor is the ability to arrange prompt transfers of funds by telegraph. Eighty years ago our foreign exchange department records show that it required about 60 days for a customer on the Pacific Coast to complete a credit transaction with a merchant in South Africa. Today it can be done in six hours.

In many parts of the world, especially China and the Orient, once customers deal with an old-established firm they are hard to change to a new one. They are not open to new faces, and when there are new gadgets or new products to be introduced, the best sales approach is through established importing firms.

Our banking institution feels that we have the experience and long-established connections to help customers who are getting ready to enter former markets or establish new ones in those areas which will open up to American trade after the war ends with Japan.

Bank of California today.



New Horizons for Trade With China



H. D. Collier
President Standard Oil Company of California, and chairman San Francisco Bay Regional Board, China-America Council of Commerce and Industry.

With the largest trade opportunities in world history soon to develop, the carefully fostered program of the China - America Council of Commerce and Industry seems likely not only to accomplish its own purpose but also to set up a model for other groups to copy. The business transactions we have with others in our domestic market often present difficulties. It is not always easy to reach, as the lawyers say, a meeting of minds. This is so in spite of the common language, common business customs, monetary and measurement standards, laws, and means of transportation as well as convenience of communication. Foreign dealings have few of these advantages, and in the case of China, where industrialization and modernization will go hand in hand with trade development in a land where nearly everything has been sacrificed to the war effort, over-all guidance by the best business brains of this country will lessen the hazards and smooth the way. The China - America Council was organized for just this purpose. Its well-planned statement of principles follows. We quote at length the sections relating to trade.

(1) Restoration of Chinese Sovereignty Paramount

(2) Two-Way Trade Objective

The development of maximum two-way trade between America and China is the objective of both countries. China has indicated its wish to promote trade and to facilitate the inflow of American capital on mutually favorable terms.

•

The China-America Council of Commerce and Industry is basically interested in fostering all conditions which, in the long run, will be conducive to sound mutual trade, and with such rewards and safeguards for the enterprises involved as will be most fruitful for the economy of both countries.



(3) Business Incentive Will Speed Development

To attain this goal, the Council places emphasis on those conditions of trade and commerce which are most likely to attract and encourage American business to participate in China's development. This approach is stressed because American business is made up of hundreds of thousands of independent enterprises, each of which is free to stay at home and develop the domestic market exclusively, or to engage in export or import trade with, or adventure abroad in, those areas which appeal most to each. There is no central authority which can force American private enterprise to go to China. This aspect is important. As the wars draw to a close, a great pent-up civilian demand in America will assert itself. Increased competition from many nations abroad will occur for American goods, capital and collaboration. These factors may limit the amounts available to China, despite the good will and interest of our business community, except as inducements offered by China are equally as favorable as from other nations. Reasonable policies that attract American enterprises to China can likewise encourage and stimulate sound Chinese enterprise.

(4) Healthy Economic Climate Will Encourage Participation

American business men traditionally have viewed with favor "The China Trade." But before deciding upon substantial ventures in the development of the Chinese economy, they must, and do, as business men, require reasonable certainty as to the actual conditions under which enterprise will live. A healthy "economic climate" must be provided in which well-managed and sincere private enterprise can flourish and produce fruit of its kind.



E. Russell Lutz
Executive vice president American President Lines. Member Executive Committee China-America Council.

American business, in its desire for the maximum development of mutual trade between America and China,

holds the fundamental conviction that the greatest and most efficient results can and will be attained by the fullest enlistment of free enterprise with government encouragement.

(5) Private Enterprise Responsibility

It is recognized that in the mutual-



Frazer A. Bailey
President Matson Navigation Co.; member S. F. Bay Regional Board, China-America Council.

ity of trade with China, there are duties which go with any rights or privileges that may be granted to Americans by China. It will be the concern of the Council to define these matters and work for appropriate policy formulation and action from time to time. The abandonment by America of Extraterritoriality and the repeal of the Chinese Exclusion Act are indications of the reality of this thought. The Council will welcome suggestions from the Chinese of any steps which would better relationships between America and China, and raise the general level on which business is done.

(6) Prompt Negotiation of Commercial Treaty

A modern treaty of friendship, commerce, navigation and consular rights should be negotiated immediately between the United States and China.

To be conducive to maximum exchange of trade, the **basic commercial treaty should cover adequately,** among other features, such points as:

(a) Freedom of residence, travel, religion, education, contract, and publication, in carrying on of commerce, trade and industry, including engaging in business by professional and scientific persons.
(b) Protection of persons and property.
(c) Freedom to organize and participate in corporations, including promotion and incorporation rights, purchase, ownership and sale of shares, holding of executive and official positions.
(d) Encouragement of private enterprise and capital.
(e) Encouragement to American technical experts and interchange of technicians and students.
(f) Trademarks, copyrights, and patents protection.
(g) Development of natural resources.
(h) Non-discriminatory taxation, tariffs and exchange rates.
(i) Safeguards against undue special monopolistic trade privileges and franchises in transportation and communications.
(j) Simplified consular and commercial travelers' regulations.
(k) Commercial arbitration.
(l) Reasonable period of liquidation of unfinished business under laws prevailing at time commitments were established to remedy hiatus between Pearl Harbor and Relinquishment of Extraterritoriality.
(m) Implementation of port and shipping rights under Extraterritoriality Treaty.
(n) Establishment of Free Trade Zones.

Pacific WORLD TRADE

(7) Trade Agreement and Non-Discriminatory Tariffs

The Council stands for non-discriminatory tariffs and supports the reciprocal trade agreements program of the American government.

(8) Attracting Venture Capital to China Vital

Every field of development in China to which American capital, ingenuity, intiative, equipment and technique can make an important contribution should be encouraged.

The Council believes that it is much sounder to look to private venture capital for financing China's reconstruction program than to rely upon intergovernmental loans. If private resources can be enlisted, so as to provide the bulk of funds required in form of direct investments by private enterprises, the obligation of the Chinese government is mainly limited to provide:

(a) healthy conditions that make possible a reasonable security for the earning of a moderate return by way of interest or dividends, and
(b) payments in foreign exchange to cover that portion of earnings which needs to be remitted as dividends and interest, plus amortization of such capital as is in the form of loans.

(9) Lend Lease Should Be Restricted to War Material

The Lend-Lease program is endorsed as a necessary war measure, if restricted to essential war material. It is felt, however, in the interest of all the citizens of the United States, that Lend-Lease operations should



Charles L. Wheeler
Executive vice president Pope & Talbot, Inc., McCormick Steamship Div.; member S. F. Bay Regional Board, China-America Council.

terminate as soon as possible, and foreign trade be returned to the customary prewar trade channels.

In the Council's opinion, there should be returned now to private channels of export trade all commodities not classified as essential war material, so that in the interest of American foreign trade now, and after the war, the customary prewar channels of commerce will be maintained and the identity of American brands and trademarks be preserved.

(10) American Banking and Insurance Institutions in China

The Council considers it of primary importance that American banks should be induced to resume their activities in China and that they be permitted to operate with maximum freedom.

For the same reasons, American in-



Fred D. Parr
President Parr-Richmond Terminal Corp.; member S. F. Bay Regional Board, China-America Council.

surance companies in China should be allowed the maximum latitude to underwrite commercial business in the interests of the trading community.

(11) Wide Fields for Private Enterprise

The Council feels that the wider the scope of commercial and industrial activity that can be defined as the accepted field of private enterprise, the greater will be the inducement to private capital, with accompanying advantages to the economy of China.

(12) Heavy and Light Industries Indivisable

The efficiency and productivity of heavy industry is the base upon which all metal working and most light industry rests.

The Council urges the desirability of examining the potentiality of attracting on acceptable terms, the contribution which American industry can make in the hereunder fields:

Natural Resources: The development of China's mineral resources is a basic objective, as near the heart of the Chinese government as any one desire. True, the government can secure the machinery with which to extract these minerals, once they have been located; but it is worth considering how far China's natural resources could be expedited and enlarged by the unique capacity which American enterprise has shown in discovering, extracting and first-processing of mineral products, and making them available at low cost.

Telecommunications: It would be an immediate advantage to tap the American communications industry for the advantages of its enormous advancements during the war and in commercial practices. The widening use of electronics is but an example.

Public Utilities: In electric power and light industry there are enormous problems to be solved in China. The utilities of the United States have made contributions to war production that have seemed incredible even to American experts. Obviously, the selection and purchase of the latest type of generating equipment is relatively simple. The establishment and progressive develop-

Pacific World Trade

ment of a complete utility operation, meeting both production and distribution requirements of home and commercial consumers, requires the continuous application of management techniques such as are taken for granted in commercial utility operations.

Transportation is a critical essential to China. It is an accepted fact that the greatest and most efficient rail transportation systems in the world are in the United States. American technique can be most helpful in developing the operation of Chinese railroads. The spectacular advances made in air transport are really only a second chapter following a highly developed peacetime industry in the United States. As to highway transportation, there is an enormous amount of factual data and American operating technique available which would accelerate the motorization of Chinese road transportation. Though America has gladly relinquished all special rights to operate vessels in Chinese waters, it is felt that American enterprise can contribute to the building up of China's water transportation system.

The Council's Transportation Committee, in consultation with Chinese experts, is seriously studying China's postwar requirements with the view to developing a basis of American collaboration.

(13) Monopolies Should Be Curtailed

American interests should be safeguarded as far as possible against the growth of monopolies, whether of special trading privileges or in the nature of monopolistic franchises in transportation or communications.

(14) Acceleration of China's Balance of Trade

Increased trade in and with China is limited by China's ability to balance her trade. An equilibrium can only be accomplished, over the long term, by substantial exports from China to many world markets. Expansion of industry under favorable conditions as envisaged by the Council includes a healthy growth in exports from China. These will be of many types not now foreseeable. The building up of foreign exchange will be the result of multilateral trade. China's exports could be expanded by stimulating better production, marketing and grading methods; higher standards of quality and commercial designing; and by abolishing export taxes.

The Council further favors reasonable augmentation of foreign exchange for China, through tourist travel by Americans in China, overseas remittances of Chinese in America, and other recognized services.

(15) Free Trade Zones Desirable

While China has had an efficient customs "draw back" system, she may well find it desirable to consider establishing a free trade zone in one or more of her principal ports, similar to such zones in New York City and many European cities. Ports are vestibules to world trade. The traffic which flows through them favorably affects the economy of every part of the nation. Foreign free trade zones can provide a type of integrated terminal service to attract new traffic to the port itself, as well as to increase commerce and coastal shipping in adjacent ports. Re-exports to neighboring countries will be greatly stimulated, as domestic products may be assembled, repacked, or combined with foreign products for export without customs difficulties. Examination of samples of merchandise is facilitated as inland importers may arrange to

examine foreign merchandise at the ports and save costly transportation expenses to interior points on merchandise which may later prove unsatisfactory.

(16) Taxation—Equitable and Certain

(17) Adequate Chinese Commercial Legislation Essential

(18) Non-Burdensome Administrative Procedures

(19) Commercial Arbitration

(20) Patents, Copyrights, and Trademarks

The Council recommends that the Chinese government give consideration to the employment of a Commission of foreign experts, for a term long enough to aid the Chinese government to design and install a Patent Office in China, and to train Chinese engineers, chemists and administrative personnel in the duties they will eventually take over.

In the fields of trademarks and trade names, considerable progress has been made by China. If an acceptable regime of patent and copyright protection is added, China can take her proper place among the leading industrial nations that are signatories to the International Convention for the Protection of Industrial Property. This is not only helpful to national prestige, but a practical prerequisite to full participation in the world's technical progress.

(21) Chinese Company Law and Registration

The Council feels that in some respects the present regulations for the registration of foreign firms could be clarified and simplified so as to make it feasible for American companies to register thereunder without serious burdens or difficulties.

(22) Corporate Nationality, Management and Stockownership

(23) China Trade Act

This law, appropriately amended to adjust it to the elimination of extraterritoriality, should be continued in the interest of encouraging greater American participation in two-way China trade.

(24) Professional Practice by Americans in China

In the interests of facilitating the conduct of business, it would be prudent to grant licenses to American doctors, engineers, lawyers and accountants to enable them to practice their professions in China.

(25) Freedom of Contract

It is the policy of the Council to encourage the fullest freedom of contract with any Chinese individual or corporation, or the national of any other country.

(26) Commercial Travelers' Facilities

To facilitate trade and encourage representatives of American firms to travel within China without undue hindrance or payment of unreasonable administrative fees or taxes or other discriminatory charges, commercial travelers regulations should not be onerous.

(27) Chambers of Commerce and Commercial Trade Organizations

The Council considers that it would be furthering the mutuality of trade, if the joining by American firms or individuals of trade associations or chambers of commerce in China were permissive rather than mandatory; also that beneficial results would accrue were American business organizations permitted to form Councils of Business (or equivalent title) in China on a voluntary basis without registration requirement, so long as they are for the assembly and dissemination of information and discussion of mutual interest.

(28) Freedom of the Press

(29) News Gathering Business

(30) International Broadcasting

China's Part In China's Industrialization

By Julean Arnold

A free China will offer vast opportunities for American enterprise. China must resume and speed up its industrialization. China's leaders undoubtedly realize that industrialization must be predicated upon:

(1) Carefully planned nation-wide agricultural improvement.

(2) A well co-ordinated system of internal communications.

(3) Industrial decentralization to minimize the dislocation of its rural economy.

(4) The extensive and progressive training of operating and maintenance personnel.

(5) Safeguards insuring security for investments of Chinese and foreign capital.

(6) Plans made in China to meet the peculiar needs of the Chinese.

America's extensive participation in trade and investments arising from China's industrialization will be aided by:

(a) Definite assurances by China of reasonably favorable conditions for large scale American investments.

(b) Encouraging the return to China of Americans experienced in trade, industry or other pursuits in China and capable of cooperating with the Chinese.

(c) Providing facilities for the expeditious training of properly qualified Americans for service in advancing American-

(Continued on page 344)



Julean Arnold
Pioneer in Chinese-American relations. Honorary Advisor to the China-America Council of Commerce and Industry.

Rubber



William C. Gulick
Assistant manager, International Division, B. F. Goodrich Co.

In our April issue we published a paper on the rubber situation and its influence on trade and shipping throughout the world. The opinions quoted were largely those of officials of the B. F. Goodrich Co., who have recently opened an export office in San Francisco for the expeditious handing of their 32,000 products.

When the enemy-occupied areas of the Netherlands Indies and Malaya are cleared, a period of several months will probably be necessary for recruiting and training native labor forces.

At the outset, we may recapture some existing rubber stocks . . . say 50,000 tons or more.

During this restoration period the United States and the world will require unprecedented quantities of rubber for military and vitally essential civilian needs.

It is the Goodrich estimate that consumption of natural and synthetic rubber in the United States following recapture of the Far Eastern plantations will average 850,000 tons, and that world consumption will approximate 1,600,000 tons a year.

While both natural and synthetic will be needed during this period, the usage of natural rubber will increase, and, unless the price of natural rubber rises sharply from the 1941 level of 18½c (f.o.b. plantations), usage of synthetic rubber will decrease.

If we assume that rubber trees in the plantation areas are found to be in reasonably good condition, but that equipment and labor will have to be obtained, here is how we may expect natural rubber to come back:

First Year After Reoccupation	Receipts From Unoccupied Territories	Receipts From Reoccupied Territories	Total Receipts
First Quarter	46,000	28,000	74,000
Second Quarter	47,000	46,000	93,000
Third Quarter	47,000	76,000	123,000
Fourth Quarter	48,000	145,000	193,000
Total	188,000	295,000	483,000
Second Year After Reoccupation			
First Quarter	40,000	192,000	232,000
Second Quarter	40,000	230,000	270,000
Third Quarter	40,000	268,000	308,000
Fourth Quarter	40,000	305,000	345,000*
Total	160,000	995,000	1,155,000
Two-Year Totals	348,000	1,290,000	1,638,000

* This is at the rate of nearly 1,400,000 tons a year, higher than the total for any year in history.



Where the rubber goes. Airplane tires ready for shipment.

But this 1,600,000 tons which we may except to obtain in a two-year period after reoccupation would equal only one year's estimated world needs for raw material.

That is why we will still have to depend upon synthetic rubber tonnage in addition to that required for national security.

The following figures show how much synthetic rubber will be needed to satisfy overall consumption demand. They clearly indicate the tapering-off of the **minimum** need for synthetic rubber as large tonnage of natural rubber again becomes available.

First Year After Reoccupation	Estimated Rubber Consumption	Potential Natural Rubber Receipts	Minimum Synthetic Requirements
First Quarter	375,000	74,000	301,000
Second Quarter	375,000	93,000	282,000
Third Quarter	375,000	123,000	252,000
Fourth Quarter	375,000	193,000	182,000
Total	1,500,000	483,000	1,017,000
Second Year After Reoccupation			
First Quarter	400,000	232,000	168,000
Second Quarter	400,000	270,000	130,000
Third Quarter	400,000	308,000	92,000
Fourth Quarter	400,000	345,000	55,000
Total	1,600,000	1,155,000	445,000
Two-Year Totals	3,100,000*	1,638,000	1,462,000

* Of this, U. S. A. consumption is estimated at 1,700,000 tons.

To summarize:

These are the factors we must be repared to deal with when the Far astern rubber lands are recaptured:

(1) Large demand for both nat-ral and synthetic rubber.

(2) Increasing natural rubber ailability.

(3) A probable decline in the need r synthetic rubber.

As to the pricing of natural rub-r:

It must be recognized that produc-on of plantation rubber will prob-ly be resumed under unprecedent-l wartime conditions and controls. et how it is reestablished will in-uence the long-term position of the ief rubber-growing areas.

A pricing policy aimed at holding large world market in the face of nthetic rubber competition will be primary importance.

At the outset, when the plantations e beginning to resume operations, e price might well be the 20c level which rubber was being laid down New York prior to occupation of e plantations by the Japanese.

This price would compensate for lower levels of production and the higher expenses during the period of restoration.



Earth-mover tire on on Army airport. This massive 890-lb. tire accounts for rubber enough to make 40 overage pre-war passenger tires.

But if the rubber growers plan now to offer natural rubber priced at 10-12c a pound (N. Y.) by the time normal production is reached—a price which should yield a fair return to efficient producers—their operations will be on a sound basis for maximum development of broadened post-war markets.

More Rubber. An oil loading hose.



Air Rights

(Continued from page 334)

not mean that they should offer any services which would detract from our effort in the Pacific. It merely means that the flow of traffic which must continue to exist across and up and down the Atlantic and with Latin America and elsewhere should become reestablished, particularly in the minds of other peoples, as the business of particular shipping companies.

We make this point because, under a peacetime economy, it is the agreed fact that the individual shipping company builds up the export and import business of the country whose flag the steamers fly. The sooner European, African and South American nations become reacquainted with the names and services of American companies the more firmly we can establish the spheres of influence which will give American ships work to do. This reestablishment of the American flag should be made completely effective at once.

Equally urgent becomes the speedy determination of the rights of the shipping companies to enlarge their service by offering air transportation in conjunction therewith. Termination of hostilities in Europe and the Atlantic theaters of operations is bound to create a considerable flow of justified travel by civilians. Transference of the armed services' primary interest to the Pacific theater will, in course of time, reduce the transport services across the Atlantic now being provided by military agencies. Commercial operators will naturally be expected to take on a more important role in handling the flow of traffic created.

Pacific World Trade

We have held that our eventual goal, particularly in the South American field, is to create a coordinated system of air and surface passenger transportation which would permit the traveler to plan his trip as a complete "package." But we shall undoubtedly be able to secure planes before we can provide adequate surface accommodations. Whether we build new passenger vessels or recondition ships returned by the armed services, a considerable interval of time must elapse before we can offer proper facilities to the traveling public.

Air Rights a Necessity

We believe, therefore, that the door should be opened as promptly as possible for organization of the air branch of our services, so that when the time comes for the logical development of the complete plan, with all it means to the development of surface traffic, our position will be recognized and established.

China's Part

(Continued from page 341)

Chinese trade and other relations.

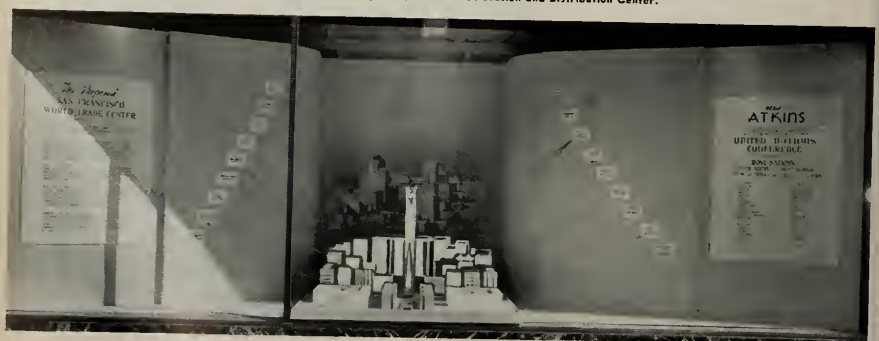
(d) Discouraging Americans engaging in business or other enterprises in China who are: (a) of questionable repute or intent; (b) temperamentally unsuited for co-operation with the Chinese; (c) lacking in prospects of satisfactory contacts in legitimate pursuits.

(e) Preventing the operation in this country for promotional enterprises in China of Chinese or others who lack satisfactory credentials.

The Chinese are industrious, intelligent, ingenious, reasonable and practical, but they are human. They respect a good bargainer. To do our part presumes our knowing the Chinese at least as well as they know us. With the pre-war beginnings made in their industrialization and with the continuous increases in the numbers of modernly trained engineers, scientists and professional and business men, the outlook is bright for American participation in investments, in technical skill and in trading operations in connection with the country's vast programs of modernization and economic reconstruction. Fortunately, we enjoy the friendship and good will of the Chinese. If we are wise we shall do everything possible to conserve this invaluable asset.

$35,000,000 WORLD TRADE CENTER ATTRACTS PUBLIC INTEREST

The men's clothing store of Robert S. Atkins, San Francisco, arranged this show window model of San Francisco's proposed World Trade Center. The ribbons lead to signs identifying the various buildings in the following order: Group of Europa Buildings; Conference Halls; International House; Area for Exhibition Building; Group of Pan-America Buildings; Tower of Jewels—Sun Diol; Steamship Office Building; Union Station for All Airports—Head Offices, Ticket Offices, Bus Station and Air Express Depot—Helicopter Landing Area on Roof; Main Entrance to World Trade Center from Proposed Elevated Embarcadero Freeway; Tower of Peace—Offices of Foreign Government Representatives and World Traders—Roof Gardens—Restaurants; Conference Halls; Group of Orient Buildings; China Building; Central Garage Three Stories High; Area for Exhibition Building; Group of Pacifica Buildings; Railroad Office Building; Motor Transport Building—Head Offices of Bus and Truck Companies, Union Truck Station and Distribution Center.





Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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The Gyro-Compass

PART VII: *Operating Principles of the Gyro-Pilot*

Automatic Steering

The Master Gyro-Compass establishes a reference line with respect to the earth's surface so accurate and so stable that even the slightest yawing of the ship is indicated simultaneously by a relative movement of the repeaters. The function of the Gyro-Pilot in automatic steering is to pick up this relative movement and convert it into corrective application of the rudder. Reference should be made to Figs. 29 and 30 when reading the following paragraphs. Figure 29 shows the mechanical arrangement of the Gyro-Pilot; Fig. 30 shows the electrical connections schematically, with the follow-up ring assemblies in simplified form for clarity.

Signal Circuit: The repeater motor within the Gyro-Pilot control unit initiates the signal for corrective rudder. The operating cycle of the signal circuit is as follows: when the ship is on its course the actuating trolleys of the contact ring assembly are in a neutral position, as shown in Fig. 29, making contact with both of the energized segments SA_1 and SA_2 of the contact rings, shorting the armature and locking the servo motor due to dynamic braking action.

Suppose the ship yaws slightly to the right of the course; the angular motion is instantly picked up by the repeater motor, and the trolley assembly rotates counterclockwise, causing the lower of the two rollers to move to the right a fraction of a degree, so that it no longer touches segment SA_1 of the contact ring assembly. The armature of the servo motor, instead of being shorted out, is now energized through circuit SA_2. The servo motor starts instantly and through the differential causes the outer member or contact rings of the control ring assembly to rotate in a clockwise direction. The energized segment C_1, therefore, makes contact with the inner member or trolley SS_1, closing the circuit to the pilot relay A. The operation of the pilot relay closes the drive-motor control relay A. Relay A closes contacts #1 and #2 by means of one of the two clapper switches and energizes the drive-motor, causing it to turn in the direction to give the ship left rudder.

The movement of the drive-motor rack and pinion operates the self-synchronous transmitter in the power unit which causes corresponding rotation of the self-synchronous receiver in the control unit binnacle. The receiver causes the trolleys SS_1 to follow the movement of the contact rings and open the circuit to the drive motor. The opening of the clapper switch energizes the down contacts and stops the drive-motor through dynamic braking action.

Figure 29 shows that the servo motor, in addition to driving the outer member of the control ring assembly through the differential, drives the outer member of the signal ring assembly, through the rudder adjustment, causing the outer member to follow the movement of the signal trolley assembly until the lower of the two trolleys again rests upon segment SA_1. This short-circuits the armature of the servo motor and stops the motor. The signal circuit sequence described in this paragraph functions independently of the control circuit to start and stop the servo motor. Whenever the servo motor is running, however, it actuates the control circuit and therefore operates the drive motor. It will be understood from the foregoing explanation that the function of the signal circuit, including the starting and stopping of the servo motor, is to provide a sensitive and accurate means of energizing the control circuit—the function of the control circuit being to provide positive control of the drive-motor.

If the ship yaws to the left instead of to the right, the repeater motor turns in the opposite direction and the upper roller of the signal trolley moves to the right, energizing the servo motor armature circuit through SA_1. The servo motor now runs in the opposite direction, control circuit C_2 and pilot relay B are energized and right rudder is applied. Again the outer member of the signal ring assembly overtakes the inner member, the signal is cut off, and the servo motor is stopped. When the servo motor stops, the outer member of the control ring assembly also stops, and its trolleys, driven by the self-synchronous receiver, cross the gap between the segments and open the circuits to the drive motor.

To describe fully the sequence between the original signal and the movement of the drive-motor would require a great deal of space in this article, and the reader may feel that the time factor between the original signal and the movement of the drive-motor is considerable. However, the functions are entirely electrical and therefore the several steps take place practically simultaneously; there is no discernible interval between the initial signal and the response of the drive-motor.

Weather and Rudder Adjustments

In order that the Gyro-Pilot may be useful under all conditions, facilities are provided in the equipment to take care of the variable factors which influence the steering of the ship, such as weather conditions and the characteristics of the ship itself. In rough weather, for instance, it is desirable to let the ship have a small amount of "weather yaw." This is accomplished by means of the weather adjustment. The "rudder" adjustment varies the amount of rudder applied for a given amount of departure from the set course.

The weather and rudder adjustments are shown diagrammatically in Fig. 29. The weather adjustment is simply a means of introducing any desired amount of lost motion between the repeater motor and the signal trolley. For example, when set for 1°, the ship can yaw that much each side of the set course without moving the trolley. When the yaw exceeds the amount for which the weather adjustment is set, the trolley is moved and rudder is applied to correct the deviation from the course.

The weather adjustment is set to 0, except in rough weather, when it is desirable to allow the ship to respond somewhat to the temporary action of heavy seas. Under such conditions the weather adjustment is opened out as required to prevent racing of the steering engine back and forth.

The rudder adjustment provides a means of controlling the amount of rudder applied for a given departure from the set course. The usual position of the rudder adjustment knob is between 0 and 2 for a light ship, and between 2 and 4 for a loaded ship. The effect of this adjustment is to delay the follow-up movement of the outer rings until a certain amount of initial rudder movement has taken place. For example, suppose the rudder adjustment is set for 3°. The ship yaws from her course sufficiently to cause the trolley to energize the servo motor. The drive-motor is energized, and the rudder is moved 3° before it is stopped. Thereafter any further deviation from the course causes the rudder to move in proportion to the degree of deviation. The amount of the initial rudder movement required in either direction depends upon whether the ship is light or loaded. By means of the rudder adjustment the first rudder movement can be made longer than

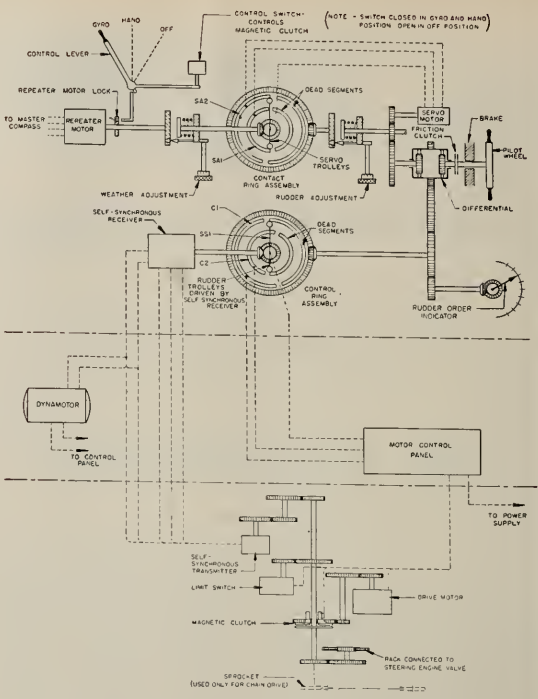


Fig. 29: Schematic drawing showing the mechanism of the gyro-pilot.

those that follow, the purpose of this being to apply sufficient rudder on first making contact to check the ship's angular momentum. If the first movement of the rudder is insufficient, additional rudder movements are given until the ship's momentum is checked. However, these succeeding movements are made smaller purposely in order to avoid returning the ship with too much rudder. Under fairly uniform conditions of sea the initial rudder adjustment can be set so that the first rudder application is sufficient to bring the ship back to her course. The rudder adjustment also provides the means of "meeting" the ship as she returns to her course. Automatic steering, in connection with the use of the rudder and weather adjustments, is more accurate than hand steering, because it is more sensitive in its response than is a human helmsman and because it permits precise control of initial rudder.

Course Changes: The gearing between the signal and control systems is such that changes in course can be made while steering by Gyro-Pilot simply by turning the pilot wheel on the Gyro-Pilot binnacle in the desired direction. One full turn of the pilot wheel will give a change in course of approximately three degrees. Also for course changes the control lever can be moved to the "hand" position and the rudder applied by turning the pilot wheel as necessary. Moving the control lever from "gyro" to the "hand" position locks the repeater motor mechanically. The entire signal circuit, including the weather and rudder adjustments, is now inoperative because with the repeater motor locked there

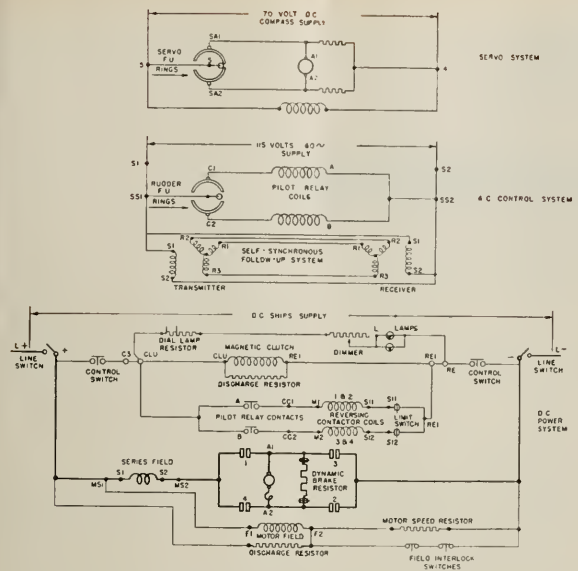


Fig. 30: Schematic wiring diagram of the gyro-pilot.

can be no movement of the signal trolleys and therefore no movement of the servo motor and the outer rings of the signal assembly. The rudder is now controlled by means of the pilot wheel, which operates through a differential and train of gears to drive the contact rings of the control ring assembly. When the control lever on the Gyro-Pilot is moved to the "off" position, the control switch in the binnacle is opened and the magnetic clutch on the power-unit disengaged. The rudder is then controlled through the ship's hydraulic telemotor system by means of the ship's wheel.

(All diagrams by courtesy of Sperry Gyroscope Co., Brooklyn, N. Y.)

Minor Collisions

A review of the comparatively minor collision cases involving American merchant vessels between July 1, 1943, and October 1, 1944, shows a total of 1,146 instances. Minor collisions, for this purpose, are defined as collisions not involving total loss or heavy damage to either vessel. Further, all collisions due to military operations, including proceeding in convoy, have been excluded in order to limit the study to cases revolving wholly about the judgment and seamanship of the personnel involved.

By the exclusion of all convoy collisions it follows that the great majority of the collisions studied occurred in port. Only 55 of the 1,146 took place between ships proceeding independently at sea. Eight hundred and seventy-five involved collisions between two vessels in harbors and in 684 of these at least one of the two vessels was at anchor, and therefore not maneuverable. There were 216 cases of vessels striking shore structures with such force as to require repairs.

In attempting to evaluate the causes of these casualties, necessarily many elements must be considered. It is recognized that even omitting military operations does not permit the casualties to be considered upon a purely peacetime basis, as they occurred in many ports which were abnormally congested and as frequently ships were under a time pressure to take up an anchorage or otherwise maneuver under unfavorable conditions.

Fifty-eight cases can be assigned to mechanical failures — steering gear, anchor engine, or the like. These mechanical failures, however, in most instances, stem from lack of care or tests or other personnel shortcomings. Eighty-four vessels were in the hands of foreign pilots, and for these the responsibility is assumed to be the pilots'. Of the balance, some 370 collisions could only be ascribed to error on the part of the master or officer in control of the navigation, including 64 cases where the Rules of the Road were violated.

Ninety-seven collisions were charitably ascribed to congested harbors, 499 to "wind, tides, etc.," and the balance to miscellaneous causes. Subject to the reservation already made that vessels have been obliged to enter or to anchor in overly congested harbors as a war measure, the fact still remains that the element of personnel and judgment must have been, in most cases, at fault. "Wind and tides" are always a part of the problems of a seaman, and must be taken into account by him.

It is recognized that this country's tremendous wartime shipbuilding program has necessitated diluting our limited supply of experienced shipmasters and the utilization of many who have not had the opportunity to develop seasoned judgment. Considering all things, they have done well. But every accident requiring shipyard repairs takes the ship out of the war effort and throws that much more burden on the overworked repair yards. Every possible effort should be made to prevent this. No panacea is possible of suggestion, but there are two thoughts of universal application: First, to take, in advance, every possible precaution that a collision will not occur; and, second, if in spite of best efforts it becomes inevitable, handle the ship so as to minimize its effect.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Questions From the Ships

Editorial Note

In a technical examination for practical operating engineers the compiler of questions should be very careful to choose the right words. The question under consideration here by "The Chief" is an excellent example of the confusion that may be caused by the use of wrong terminology.

A "ship" does not "steam" nor does she "burn fuel"—she sails. A steamer "burns fuel" in a boiler and she "steams." A motorship "burns fuel" in an internal combustion engine and she also, for want of a better term, "steams."

A knot is not a measure of distance but is a measure of speed and equals one nautical mile per hour.

There is no fixed ratio between the powers necessary to drive the same steamer at two different speeds. Nor is there any fixed ratio between the rates of fuel consumption at different power-output for the same boiler or set of boilers.

"The Chief" in his solution assumes: that the steam rate of the prime mover is the same at the low power as it is at the high power; and that the fuel economy rate of the boiler plant remains constant over a very wide range of output.—(Ed.)

Question

Dear Sir:

A question found on page 17, Examination for First Asst. Engineer in the new book of Specimen Examinations for Merchant Marine Engineer's License, is as follows:

"A ship burns 225 tons of fuel in steaming 1000 knots at 13 knots per hour. How much will she require for a distance of 2000 knots at 10 knots per hour?"

Your reply and rule will be appreciated by the entire engineering department here. —N. H. J.

Answer

Both horsepower and fuel consumption of ships, propeller fans and many fluid handling machines, increase approximately with the cube of the speed. That is, to double the speed requires $2\times2\times2=8$ times as much fuel per hour. To increase speed 10 per cent means $(1.1)^3=1.33$ or 33 per cent more fuel.

See comments below.

Solution of Problem

To find fuel consumed per knot. 225 divided by 1000 equals .225 tons per knot at 13 knots per hour. This fuel rate changes and reduces as the cube of the speed.

To find the new fuel rate at 10 knots per hour.

New rate is old rate times cube of ratio

or .225 times 10 cubed divided by 13 cubed

or .225 times 1000 divided by 2197

or .225 times .455 = .102375 tons per knot.

To find the new total fuel used for 2000 knots steaming .102375 times 2000=204.750 or 204¾ tons.

Comments

Note that at only three knots less in speed she burns 20 tons less in 2000 knots than she formerly did for 1000 knots.

If this were set up by an experienced mathematician it would be:

$$\text{New total fuel} = 225 \times \frac{2000}{1000} \times \left(\frac{10}{13}\right)^3 = 204.75$$

"The Chief" takes this opportunity to direct the attention of all marine engineers to the unscientific, backward and confusing usage of speed and distance units by marine engineers, navigators and air pilots. "The Chief" asks that those in authority take constructive steps to standardize a distance unit which will be different from the speed unit and is understandable.

At one time, not many years ago, the knot was a speed unit, being one nautical mile per hour (the nautical mile is 6080.20 feet, the land mile is 5280 feet). The nautical mile is a well standardized distance unit, and all maritime charts in English are laid out with this unit. But the name "nautical mile" is too cumbersome to use, and in these modern times it is being called the "knot," because the word is short.

Formerly, the knot as a speed unit of one nautical mile per hour was named from the practice of determining the sailing vessel's speed through the water by dropping astern a small sea anchor and a log line. The navigator would have a sand glass, small size, timed to 28 seconds. There were several knots tied on the line secured to the sea anchor, and as the ship made headway forward these knots were counted as they passed over the stern rail.

The distance between knots in this line was in the same ratio to a nautical mile (6080 feet) as 28 seconds were to an hour (3600 seconds), which works out at 47 feet 3 inches. Therefore the number of knots over the stern in 28 seconds was also the number of nautical miles per hour. The number of knots as counted was the speed of the vessel. Thus the knot was a speed unit, not a distance.

In those days the navigator never referred to the distance covered as 1000 knots. He called it 1000 nautical miles, or, frequently, miles.

However, as frequent use of a term, even if in error, eventually makes it acceptable, so the frequent reference to distance as so many knots has come to be at least understandable, if not correct nor so defined in the dictionary.

The air pilot and air navigator use land miles (5280 feet) when over land, and must use nautical miles over water. The reason for this is that the charts are so indicated and this unit is an even multiple of degrees and minutes of latitude at the earth's surface (one nautical mile of 6080.20 feet is equivalent to one minute of arc). The circumference of the earth at the equator then is 360×60=21600 minutes of arc and also nautical miles. Air crews thus must correct their speed indicators and all distance and fuel consumption calculations for the nautical mile. Naval aircraft usually are calibrated for this distance unit.

It seems like a cumbersome procedure to teach a young student that the knot is either speed or distance and he must determine which from the context of the sentence or paragraph.

In shoreside practice there is no speed unit as such. Therefore speed is referred to as miles per hour, although loosely when referring to speed it is sometimes stated as so many miles (the "per hour" is understood). In marine engineering we regularly refer to pressure as "pounds" when correctly we should use "pounds per square inch."

Inasmuch as we now have a short, distinct name for speed at sea, "The Chief" makes the suggestion that a term other than knot be used for distance. As a starter it is suggested that the distance unit be "seamile," pronounced sea-mile. Perhaps others will have a better name to take the place of the incorrect term "knot" and the cumbersome correct name "nautical mile."

Thus a ship would steam at 17 knots and would cover 17 seamiles in one hour.

Suggestions for a name for the nautical mile are invited. Mail to "The Chief," care Pacific Marine Review, 500 Sansome Street, San Francisco 11, California. It is suggested that engineers bring this question up with deck officers, as they are perhaps more interested than the engineers.

The horsepower requirement of a ship, assumed in the solution of the above problem as being proportional to the cube of the speed, is actually only theoretically so. Mechanical friction, such as bearings, engine friction, and so on, varies only slightly with the speed. To double the speed does not change the friction force very much. Horsepower being the product of speed times the friction force therefore will vary with the speed, and double speed means double horsepower for mechanical friction. This is called the "first power variable." Liquid friction, such as centrifugal pump churning against a closed discharge valve, or a ship propeller churning while she is tied to the dock, varies as the speed. To double the speed is to double the friction force or torque. Horsepower therefore varies as the square of the speed (the square variable).

If the pump is delivering water, or if the ship is moving at speed through the water, the friction force or torque (as the case may be) varies with the square of the speed approximately. Thus to double the speed means to require four times the force of torque. Then again the horsepower being the product of force or torque and speed the horsepower varies as the cube of the speed. Double speed is 8 times horsepower (the cube variable).

But actually the power required to drive a ship is partly used in mechanical friction (first power variable), partly in liquid friction (the square variable), in that the slip of the propeller is a liquid friction component, and partly in pushing the ship through the water (the cube variable). All these added up make a ratio which is surely more than the square of the speed ratio but probably slightly less than the cube of the speed ratio.

It has been customary to use the cube ratio as correct in most problems, and actual experience has shown this to be very close to the recorded figures.

Other variables which may make this either closer to or further from the cube speed of the speed ratio are: change in engine or boiler efficiency with horsepower output; change in propeller characteristics as it approaches its ultimate thrust capacity and increases slip, with speed and load; change in ship's auxiliary load. For instance, if the fuel consumption varied accurately as the cube of the speed, at one-half speed we burn one-eighth of the fuel per hour. At one-tenth speed we burn one one-thousandth of the fuel. But the auxiliaries burn more than this with the ship at standstill. So the ratio is not accurate at less than 10 per cent speed and at over 90 per cent maximum speed.

Owing to the timeliness of this topic, the series of articles on brushes and commutators has only been interrupted. Our next article will continue the electrical subject.

BOOK REVIEWS

American Marine Diesel Engines, by Louis R. Ford (Diesel Publications, Inc. $1.75). The author editor of "Motorship" has prepared a very valuable book covering sixteen makes of American marine diesel engines. It is primarily an operating engineer's handbook and its excellent illustrations and diagrams provide a thorough understanding of the functioning of each engine.

Diving, Cutting and Welding in Underwater Salvage Operations, by Frank E. Thompson, Jr. (Cornell Maritime Press. $2.00). The author, who is an operator, designer and manufacturer of underwater salvage equipment, has worked closely with the Salvage Section of the Navy at Pearl Harbor and elsewhere, before and since December 7, 1941. This is a "How to do" manual for men who want a well-paid, skilled, constructive, and exciting wartime and post-war job.

Damage Control, by Thomas J. Kelly, Captain USN (D. Van Nostrand Company, Inc. $2.50). This book correlates the duties of the Damage Control Officer and the developing and training of a damage control organization. It has comprehensive sections on hull systems, fire-fighting, and repairing damage in action, as well as other pertinent data. The text is concise and lucid in style and is recommended reading for all navy personnel.

Marine Piping Hankbook, by Edward P. Goehring (Cornell Maritime Press. $5.00). This handbook deals with every type of piping installation. The most complicated and exacting specifications are analyzed and explained. There are excellent design charts, and 69 tables including 30 pages of steam tables for ready reference. It should prove equally valuable to designers, fitters and operators.



The Shaver, 130.9 x 30.8 x 6.7, is owned and operated by the Shaver Transportation Company at Portland, Oregon. Formerly a steam-powered stern wheeler, she was converted into a twin screw tunnel stern diesel-powered vessel in 1926. For main propulsion she carries a pair of 400-hp Atlas diesels, and a 50-hp Atlas diesel for auxiliary service.

Low Maintenance Cost of Heavy Duty Diesels

The Shaver Transportation Company of Portland, Oregon, among the largest towboat operators on the Columbia River, cite their experiences with a pair of 400-hp direct reversible Atlas diesels installed in their towboat Shaver to substantiate their contention that slow speed and heavy duty construction resolve themselves into low maintenance costs.

The Shaver was originally a steam-powered stern wheeler, and due to the favorable experience they had had with a number of other Atlas diesels installed in their river tugs, they decided to convert this steam stern wheeler into a diesel-propelled twin screw, tunnel stern motorship. J. H. Johnston, pioneer naval architect, boat builder and propeller expert, was assigned the task of drawing plans for conversion. Complete description and drawings covering this job will be found in Pacific Marine Review issues of October and November, 1926. The job was unique inasmuch as both the method of propulsion and the type of power were to be changed, and boatmen of the Columbia River and Puget Sound followed the conversion closely.

A pair of 400-hp direct reversible Atlas diesels were chosen for main propulsion and a tunnel stern was constructed for the twin screws. Two main rudders were placed aft of the propellers and a pair of monkey rudders forward, all controlled by a Johnson-Fries pneumatic steering gear. The towing winch was also changed over to air operation. The structural changes were completed and machinery installed in the late summer of 1926 and her trial trip in September of that year brought out many famous names in the marine fraternity of the Pacific Northwest.

Three years passed, during which the Shaver gave reliable and economical performance in towing million-foot tows from the lower Columbia River to the Portland lumber mills, and assisting in the towing of large Benson timber seagoing eight-million-feet rafts from Wallace Island to Warrenton. At the end of these first three years the log book showed 17,500 actual working hours and the Shaver management decided it was time to lay up the boat and give the Atlas diesels a thorough routine inspection. They pulled the pistons, ground the valves, and installed new piston rings. Bearings were checked for the first time, and an average of .005 inch shim was removed from each bearing.

Three more years passed, during which the Shaver engaged in identical service, and upon completion of another 17,500 hours of operation the management decided to make the same repairs again. When the Shaver returned to service, after completing 35,000 hours of the toughest towing encountered in the business, the Shaver management made a complete accounting to determine the actual cost of maintenance per horsepower per year for the six-year period. They knew that the costs had been very moderate, which had perhaps failed to prompt them to make a complete cost analysis earlier. They were more than agreeably surprised when they got the final figure of 74.6 cents per horsepower per year.

That is the history of maintenance for the first six years of the Shaver's career afer conversion. Two more six-year periods have passed in the

life of this Atlas-diesel-powered towboat. During this period one new set of cylinder liners has been installed and the crankshaft has been rebedded with one new set of bearings. The Shaver is going as strong as ever today in spite of a fire which almost destroyed the vessel and necessitated a three-month repair job in the shipyard.

The history of the Shaver Transportation Company is a long and honorable record of achievement closely interwoven with the history and development of the Pacific Northwest.

George W. Shaver, the pioneer member of the family and its first president, arrived in Portland in 1854.

George W., with James W. Shaver, his son, became interested in the boat business on the Columbia River and its tributaries when they associated themselves with other pioneer Oregon men in the forming of the Peoples' Freighting Company in 1880. Later on, George M. Shaver, another son, entered the business, and in 1893 the father and the two sons organized the Shaver Transportation Company. At that time the company owned the stern wheel steamer G. W. Shaver, and in that year built the steamer Sarah Dixon, both vessels named after the original founder, George W. Shaver, and his wife, Sarah Dixon Shaver. The company engaged in the freight and passenger business between Astoria, Portland, and The Dalles, and later on a younger son, Captain Delmer Shaver, now president of the company, and Lincoln Shaver, who had been engaged in the river boat business on the Fraser River, entered the organization.

The company gradually enlarged its fleet with more stern wheelers, and in 1902 began to change its operation from a freight and passenger

(Page 364, please)







Top of page: Officials of the Shaver Transportation Company of Portland: Capt. Leonard Shaver, vice president and dispatcher; Capt. Homer Shaver, general manager; Capt. George M. Shaver, secretary-treasurer; and Capt. Delmer Shaver, general manager.

Center: The main rudders are installed aft of the propellers, and forward of the propellers are two smaller monkey rudders, the total area of the four rudders being 110 sq. ft.

Bottom: The four rudders, actuated by this Johnson-Fries pneumatic steering gear, have given the vessel maximum maneuverability. Running one Atlas diesel forward and reversing the other with the rudder hard over moves the vessel practically sideways, a great convenience when docking in close quarters.

In New Home



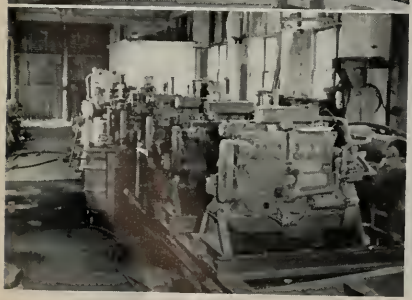
Salesroom.



View looking down in Ports Department.



Left: Corner of Ports Department.



Lower left: Assembly plant, showing a group of 50-kw diesel generator sets being tested.

Lower right: Front of office, warehouse and service building at 774 Folsom Street, San Francisco.

The King-Knight Company, organized in 1920 as a partnership between Remi C. Knight and Lyman S. King, have been for years active in the marine field, not only in San Francisco but on the entire Pacific Coast.

They have recently consolidated their headquarters' Engineering and Sales Offices with their Parts Department, and occupy a building in San Francisco. On entering the building there is a large display room in which various sizes of engines are shown. On the left of the display room are the Engineering Offices, and on the right is the Parts Department.

In the Parts Department there is a good stock of parts for the various models of Buda engines and Sterling engines handled by this company. These parts are all treated with "tectyl" and wrapped for purposes of preservation. The Parts Department occupies a space 20 x 60 ft., with room for expansion. A shop is located in the back of the building, facing an alley. Two large truck doors give access for bringing in or shipping out engines and parts.

The company have represented the Skinner Engine Company for many years and have just completed the installation of a Skinner Unaflow steam marine engine in the Santa Fe Railroad Co. tug J. W. Engel, which was built by Consolidated Steel Corporation, Los Angeles, and is de-







Lyman S. King (top) and Remi C. Knight, partners.

ribed and illustrated in this issue of acific Marine Review.

They have also represented for ars the Kinney Manufacturing ompany, furnishing a large propor-on of the oil pumps for tankers and rges built on the West Coast, as ell as for many refinery applications r the oil companies.

During the years they have repre-nted the Sterling Engine Company ey have furnished many Sterling gines in the marine and industrial lds. Most notable of these are the ree Portland fireboats and the Ta-ma fireboat, all powered with these gines, both for propulsion and for iving of fire pumps.

The company have for years fur-shed diesel and gasoline engine iven generator sets for both ship-board and land use, and have an enviable record for the quality of their products.

In 1942 they took over the distributorship for the Buda Company for Northern California, and during the war they have furnished many Buda diesel generator sets for the armed forces.

In taking over the new quarters at 774 Folsom Street, the Parts Department has been materially expanded in an endeavor to give the owners of King-Knight equipment every possible service. Aside from the Parts Department, experienced service men are available for the maintenance of this equipment.

In the engineering and sales department are R. C. Knight, Lyman S. King, R. W. Hart and Robert S. Adams, all of whom are graduate engineers with many years' experience in mechanical and electrical problems.

In the service department are E. J. McCullogh, who specializes on diesel engineering service, assisted by J. H. Leonberger and J. C. Cox. Mr. Cox has supervised the installations of many of the Skinner engines in the CVE Aircraft Escort Carriers built at the Kaiser Vancouver yard, and the Skinner installations on the LSD's built at Moore Dry Dock Company, as well as having supervised many Skinner stationary installations.

The Buda Parts Department is handled by Bill Newberry, who has handled these parts for many years.

The company have furnished during the war numerous diesel, gasoline and steam turbine driven generator sets. These are assembled and tested at the company's Emeryville assembly plant under the direction of W. A. Krauser.

Repairs for Instruments

Starting business in a small two-man shop in uptown San Francisco less than three years ago, the Marine Instrument Company has grown into a five-division organization occupying a three-story building at a more convenient location.

The original two-man shop was opened by C. H. Peabody and J. A. Benoit, both of whom had years of experience in the manufacture, repair and servicing of all types of instruments. Realizing the need for such a shop for repairing marine, industrial and aviation instruments in the busy San Francisco Bay Area, the two owners soon found themselves swamped with business and began adding to their shop equipment and personnel. Each new employee was given an intensive six-months' training in this type of work.

In its new shops and testing laboratories the company now has five divisions, each in charge of a trained and thoroughly experienced technician. These are the Marine Division,



Front of Marine Instrument Co. plant. Staff officials in order are: Jos. Ruggiero, shop foreman; J. J. Morrison, supt. and sales manager; A. H. Thrasch, manager Meter Division; Rudolph Otto, manager Therma Controls Division.





Meter Division, Thermo Control Division, Industrial Division, and a newly-organized Electronic Division. As a result, the company's services cover the complete field of instrumentation with technicians trained in the repairing, calibrating, engineering and installing of every type of instrument.

On the executive staff, in addition to owners Peabody and Benoit, are J. J. Morrison, plant superintendent and sales manager; Joseph Ruggiero, shop foreman; A. H. Tresch, manager of the Meter Division; and Rudolph Otto, manager of the Thermo Control Division.

The company also has set up a program of training Navy personnel which provides an intensive course in calibrating, overhauling and servicing of all types of instruments used on Navy vessels.

Technicians are available for trial runs on submarines and surface craft to check on and see that all instruments are in proper operating condition.

The company officials and their staff anticipate a continued post-war demand for their services in the marine and industrial fields, where the increasing use of scientific instruments of all kinds is now a definitely established practice.

J. A. Benoit (top) and C. H. Peabody, co-owners.



Section of top floor of Instrument Repair Shop.

Insurance for Merchant Officers

American merchant marine officers can now obtain coverage against their loss of wages as well as cost of subsistence and legal expenses consequent upon casualties occurring either on the high seas or other waters. This coverage is issued as an extension to a policy covering Personal Effects, Instruments and Equipment against loss resulting from stranding, sinking, burning or collision of the vessel. The policy and the license extension set forth the details of this coverage in clear and simple language.

The protection is being offered for the first time to American merchant marine officers by American stock insurance companies, comprising The Merchant Officers Protective Syndicate. These companies are the Aetna Insurance Company, Hartford, Conn.; The Automobile Insurance Company, Hartford, Conn.; and The Connecticut Fire Insurance Company of Hartford, Conn.

BOOK REVIEWS

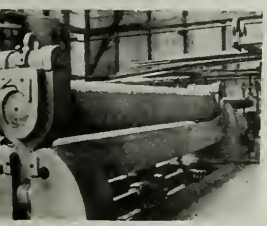
"Self-Priming Centrifugal Pumps," put out by the Marlow Pumps of Ridgewood, New Jersey, and written by A. S. Marlow, Jr., is the first authoritative work on this new and increasingly important kind of pump. The handbook sets forth the principles of centrifugal action, the physics on pumping and the evolution of self-priming centrifugal pumps. The book is scientific in content, but ingenious use of illustrations and the use of simple, direct language make it particularly useful as a text and reference work in engineering schools.

Introduction to Steel Shipbuilding, by Elijah Baker, III (McGraw-Hill Book Company, Inc. $3.00. This book is written primarily for the apprentice shipbuilder. It is intended for no particular shipyard trade, but rather to make a worker in any craft see himself in relation to the completed ship. It contains an excellent section of shipbuilding terms and their definitions, plus a diagram of the ship employing the definitions. This is a very informative handbook for anyone who wishes to become familiar with shipbuilding and the principles on which the design of the structure of a ship is based.

Coast Manufacturer of Blocks

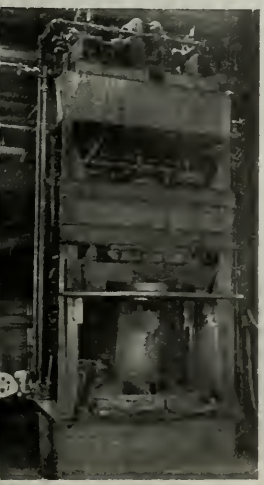
The Bestco Manufacturing Corporation of Berkeley, California, is a subsidiary of the Berkeley Steel Construction Company, formed at the request of the U. S. Maritime Commission for the purpose of manufacturing tackle blocks of all sizes.

At the time of the initial order, the Berkeley Steel Construction Company had just completed a contract for all cargo booms on the first 30 British cargo vessels, and another large order for similar booms on U. S. Maritime Commission cargo vessels. These cargo boom contracts were completed so far ahead of schedule that immediate production of the necessary cargo blocks was imperative. The U. S. Maritime Commission suggested that the Neilson brothers, owners of the Berkeley Steel Construction Company, undertake the work, and so the Bestco Manufacturing Company was organized and started construction of a new plant in April, 1942, to produce all types and sizes of blocks.



Above: Capacity 1¼" plate rolls, Berkeley Steel Construction Co.

Below: 300-ton hydraulic press built by Berkeley Steel Construction Co.



The plant, situated in Berkeley, California, on the Eastshore Highway, covers an area of about 100,000 sq. ft. The machinery is housed in three large frame buildings; machinery and material handling layout is planned for the mass production of blocks of all kinds. Machine tool equipment is installed for the manufacture of practically every variety and size of block that may be needed for marine or industrial use.

In a little over two months' time the plant buildings were erected, all machinery installed, the necessary jigs, dies, fixtures and patterns all designed and manufactured, and blocks were being delivered on schedule in June, 1942. In accomplishing the above task it was necessary to make the original designs and detail plans for over 250 different blocks, and at the same time design and manufacture the tooling and facilities for them. This taxed the energies of the technical staff, working to the limit day and night until the plant was in







Right, top to bottom: Thomas S. Neilson, president and general manager, Berkeley Steel Construction Co.; Duncan Neilson, vice president, Berkeley Steel Construction Co.; and N. W. Cousins, president and general manager, Bestco Mfg. Corp.









Left, top to bottom: Portion of Block Assembly Shop; part of storerooms; sheave storage; shearing plates for blocks.

Below, top to bottom: Assembling snatch blocks; section of Machine Shop; breaking block straps.







full operation. Much of the machinery had to be specially designed and built in the plant from such material as was available, since no manufacturer would undertake the supply of such machinery on any reasonable delivery.

The first order was for all blocks required on 125 Liberty ships, and this was followed by other orders from such Federal Government agencies and departments as the U. S. Maritime Commission, the U. S. Navy, the U. S. Army Engineers, U. S. Army Ordnance and the War Shipping Administration. To date Bestco has produced all blocks for over 300 Liberty and Victory ships, and also blocks for U. S. Maritime Commission tankers, Army transport vessels, all types of Navy combat vessels, Army tanks, half tracks and trucks—a total of over a half million blocks, varying in size and type from small halyard blocks to 100-ton cargo hoist blocks.

Throughout this program, and in spite of the high production record, particular emphasis has always been put on a high quality product. This emphasis has been the subject of commendation by all of the Government agencies involved.

The following is a quotation from a recent Army Ordnance letter to Bestco Corporation:

"I want to congratulate you and your loyal workers for the important part you have played in this victory. Our men overseas have fought nobly and well, but they have been dependent upon organizations like yours to get Ordnance to them, and on time. You can be justly proud of the splendid part you have played in defeating the Nazis."

Marine work is by no means a new undertaking for the Neilson brothers, who learned shipbuilding on the Clyde, Scotland, prior to World War I. During the great American shipbuilding effort in that war they supervised hull construction on the large U. S. Shipping Board contracts at the Seattle Construction and Dry Dock Co. yard in Seattle, and since that time they have managed the Berkeley Steel Construction Company, building steel refinery equipment, pressure vessels of all kinds, tank and structural work, barges, tugs and various types of small vessels.

The president and general manager of Bestco is Newton W. Couzins, who has been with the parent organization as chief engineer for many years.

Keep Posted

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Safety Device Reduces Crane Boom Failures

Providing positive protection against costly accidents resulting from raising crane booms beyond their safe elevation, the Thomas Automatic Boom Stop Control is an air or vacuum - operated system which disengages the main drive clutch instantly the moment the boom is raised above safe limits.

A limit-control valve, mounted on the cab frame in line with one leg of the boom, is positioned to operate on contact with the boom as the boom approaches its maximum safe elevation. Operation of the valve immediately releases the air or vacuum pressure in the system, causing the spring-loaded clutch booster cylinder to disengage the clutch and stop further boom raising. Unlike mechanical stop devices, the Thomas control stops the boom without shock and thus places no dangerous strains upon heavily loaded booms.

The Thomas control has been installed on over 200 cranes operating in shipyards, Army depots and industrial plants throughout the country.

The manufacturers are Industrial Equipment Company, 59th and Doyle Streets, Emeryville 8, California.

Auxiliary Diesel Generating Set

A new model diesel generating plant, originally designed for marine service but equally suitable for industrial applications where small size and maximum output are factors, is now in large scale production by Bardco Manufacturing & Sales Company of Los Angeles, Calif., and Dayton, Ohio.

The direct current model, DD40, is rated at 40 kw for continuous service, with the alternating current model designated as DA40, with the same rating. Both plants have the new single-bearing Bardco generators, operating at 1800 rpm.

The direct current model for marine service has a compound wound, ABS drip-proof generator, and is also equipped with an enclosed, self-contained fresh water cooling system that replaces the usual radiator. Within the sheet steel housing are the heat

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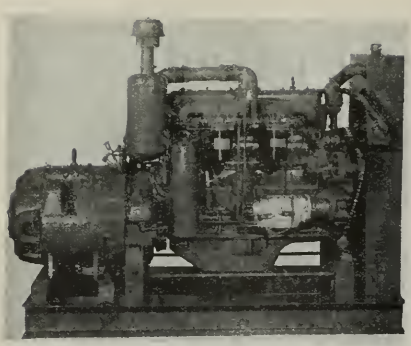
(Identify by name of manufacturer)

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Upper left: Auxiliary generating set.

Right: "Little Giant" rubber ship - to - ship fender.

exchanger, make-up tank, gear-type raw water pump, and beneath these units a spare parts and tool cabinet.

To prevent operation at unsafe temperature or oil pressure levels, Bardco automatic safety controls stop the plant when water temperature or oil pressure reach predetermined levels. All sets have a 24-volt starting system, with an electric air-preheater for cold weather starting.

The generators are powered with model T126 Chrysler six-cylinder diesel engines, connected to the generators by patented Bardco flexible couplings. These generating plants are now installed in commercial fishing vessels, and hundreds have been shipped for Government and industrial service during recent months.

Full-Revolving Tractor Crane

The Industrial Equipment Company of Emeryville, California, announces the volume production of their new Model D Full-Revolving Tractor Crane. Mounted on the Case Model DI tractor, the new unit has a lifting capacity (based upon 75% of overturning load) ranging from 1500 to 6000 pounds, depending on boom angle and working radius. Standard boom length is 16 feet; longer booms, and special telescoping and gooseneck designs are available on order.

Designed primarily for fast, low-cost load handling, the new unit features high mobility and rapid, accurate control. With a turning radius of 15 feet and traveling speeds up to 15 m.p.h., the highly maneuverable Model D lifts, transports and spot loads quickly in plant operating areas, loading docks, boxcars or storage yards. Controls are convenient and easy to operate, in addition to the regular tractor controls (which are not altered in mounting the crane), a hoist lever and turntable lever control all operations.

All lead stresses are carried by a heavy-duty welded steel frame bearing directly upon the tractor axles, relieving the tractor crankcase and transmission housing castings of all strains imposed by hoisting and transporting loads. Frame design permits easy access to tractor engine, and the regular tractor rear power take-off and drawbar are left clear so the unit may be used for regular tractor work when not engaged in load handling.

"Little Giant" Rubber Fender

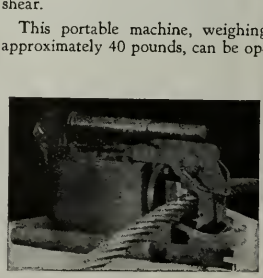
Schou-Gallis & Company, Ltd., of 250 Sacramento Street, San Francisco, are the exclusive distributors for the Bay Area, Northern California, Oregon and Washington territories of the "Little Giant" ship-to-ship rubber fender.

This unique type of fender is now in use on all ships sailing to the South and West Pacific seas, where they must be equipped with collision fenders. These supersede the old-fashioned Manila rope fenders, and practically all of the material used in their manufacture is of a non-critical variety. The outside is composed of ten old rubber automobile tires fastened together by means of a ⅜" flexible wire rope. Inside this stack of tires, securely fastened by the wire rope, is a canvas receptacle tightly packed with scrap cork and balsa wood. The approximate weight of the fender is 260 pounds, the height is 30", and the length 44". It is easily stowed and handled, and is very durable.

New Portable Cable Cutter

P. S. Pell & Company, with offices at 436 Rialto Building, San Francisco, are now marketing a new cable cutter, known as the Pelway Hydra-shear.

This portable machine, weighing approximately 40 pounds, can be op-



erated by man or woman, and cuts any type of stranded wire rope or cable up to and including 1 inch in diameter without any adjustment. Occupying a space 13" long by 5" wide by 7" high, the Hydrashear employs the hydraulic pressure principle to cut the wire rope or cable economically and quickly. The blade and cutting die used eliminates all whip and play-back, prevents flattening and deformation of the cable, and on the completion of hundreds of cuts it can be removed, sharpened and replaced in a matter of minutes. Of all-steel construction, completely self-contained, and requiring no outside power, the outstanding feature is its portability.

It is recommended for use on shipboard, for shipyards, ship chandlers, wire rope manufacturers, oil field operators, crane manufacturers, logging industry, public utilities and contractors.

Fireproof Fiberglas Draperies Available

Elimination of a serious fire hazard in places of public assembly has been made possible by development of new processes for dyeing and printing decorative fabrics woven of incombustible glass fibers.

Ordinary methods of flame-proofing inflammable fabrics have not eliminated the fire hazard, partly because the effectiveness of the treatment depends upon the skill of the flame-proofer, and partly because the flame-proofing must be renewed at regular intervals, involving a recurring expense.

Fiberglas fabrics were produced as long ago as 1936 and are widely used for industrial and war purposes. But because no means was found to make dyes adhere to the glass, their use for decoration has always appeared to be limited. Color could be added to the molten glass batch, but satisfactory effects could be produced only in pastel shades.

Within the past year this obstacle to the wide use of fire-safe Fiberglas decorative fabrics has been removed. It is now possible to dye the fabrics in many brilliant solid colors and shades. Stripes, figures and prints have been developed in a variety sufficient to meet all decorative needs.

In weight most of these Fiberglas materials compare with damask or heavy satin. They fall into attractive folds, but do not retain wrinkles. All of them can be dry-cleaned, and the whites can be laundered and ironed. Because they are made of glass they are mothproof. For the same reason they will not rot or disintegrate under the severest climatic conditions, nor will they stretch or sag under changes in humidity. Their colors are fast to sunlight and cleaning.

Prefabricated Boiler Control Panel

Prefabricated boiler control panels which include all necessary connecting piping and electrical wiring for the operation of metering equipment and boiler control systems are now offered by Bailey Meter Company, Cleveland 10, Ohio, to simplify the user's problem of installation. These panels which are factory fabricated and tested by experienced instrument mechanics are said to save installation time, to insure the use of suitable materials, to reduce total installed cost, and to present a neat, pleasing appearance. All piping and wiring necessary for operation is installed as a unit according to a coordinated and prearranged plan instead of as piecemeal operations by various contractors in the field.

Small units such as valves, relays, switches, signal lights, and the more sturdy and lightweight instruments are mounted and connected ready for service. Heavy instruments or instruments having delicate mechanisms are shipped separately; but cutout spaces, drilling and all necessary connections are provided so that their installation in the field is a foolproof, quick and easy operation.

Easy Handling Of Bulky Loads

Lightweight material in bulk can be handled more economically by means of power equipment than by manual labor, in the experience of many manufacturers. A Michigan producer of waxed paper wrappings for bread and other commodities trims the edges of paper when it comes from processing machines. Most of the "trim" is a little wider than ticker tape, yet tons of it accumulate quickly. This paper has a high salvage value, particularly under wartime conditions.



The loaded bin can be elevated to any height.

Large bins mounted on dollies were constructed to receive the trim, and when these were filled they were pushed manually to the plant's platform, where their loads were transferred by hand to road trucks. The company finally made a regular practice of using one of its Elwell-Parker high-lift platform trucks to perform all the steps in this operation. It found this to be a faster, less expensive, and "all-around more satisfactory method." Similar experiences are reported by other paper manufacturers and processors.

As shown in the illustration, the loaded bin can be elevated to any height, and when its hinged front is dropped, most of the load, which is of a slippery character, slides of its own weight into the body of the road truck. The application indicates the adaptability of electric power trucks to many other tasks related to handling light but large loads. Trucks equipped with tilting fork or platform can be supplied for operations similar to the above when necessary.

BOOK REVIEW

The Production Conference, by Jack L. Wolff (Houghton Mifflin Company. $2.25). The author has had 25 years industrial experience in the oil and shipbuilding industries. He is at present supervisor, Shipyard Training, Division of Shipyard Labor Relations, United States Maritime Commission, Washington, D. C. This book faces the problem of lack of experienced supervisors and gives tested means for quickly and effectively training and utilizing supervisors. The method outlined enables supervisors to increase production and deal efficiently with modern industrial problems.

On the Ways—

SHIPS IN THE MAKING

New Contract

Emphasizing the stress now being placed on the Japanese War, the U.S. Navy has just awarded a contract to the San Francisco Yard of Bethlehem Steel Company, for the construction of eight aircraft transportation lighters. The lighters will be about 200 feet long with a beam of over 60 feet. They are designed for special service in Southwest Pacific areas of action. Work will start at the earliest possible date commensurate with other San Francisco Yard commitments.

Destroyer Berry Commissioned

Another powerful 2200-ton destroyer, USS Fred T. Berry, was commissioned at the Bethlehem Steel Company yard, Terminal Island, California, May 12.

Commodore S. F. Heim, USN, commander of the U. S. Naval Operating Base, San Pedro, commissioned the new ship and placed Commander Nickolas J. Frank, Jr., USN, Detroit, Michigan, in command. The ship is named for Comdr. Fred Thomas Berry, USN, who died at sea, April, 1933, in the crash of the airship, USS Akron. Sponsor of ship when she was launched January 28, 1945, was Mrs. Fred Thomas Berry, Coronado, California, widow of the naval officer.

The Berry is 390 feet in length with a beam of 40 feet, and carries twin five-inch guns, torpedoes and depth charges to add to the already mighty power of the United States Fleet.

Contract Completed

Contract on the construction of eight YF barges was completed recently with the delivery of YF-725, at Everett Pacific. In their various duties of carrying freight, spare parts and ordnance, these YF barges play an important, if unglorious, part in the service of the fleet.



SS Grove City Victory, built at Richmond shipyard of Permanente Metals Corporation and launched April 28 from Yard 2. It is Richmoed's 700th ship.

Everett Pacific Delivers Navy Barracks Ship

Delivery was made to the Navy recently by the Everett Pacific Shipbuilding and Dry Dock Company, Everett, Washington, of the APL-30 Navy Barracks ship, the first of her type to be built on Puget Sound.

Two hundred and sixty feet long with a forty-eight foot beam this ship provides modern accommodations for 800 men and is destined for use in our advanced Naval bases, either as a barracks for personnel of the base



Before the commissioning ceremonies of the USS Lofberg, built at San Francisco yard of Bethlehem Steel Company, Commander Robert Beer, USN, helps unfurl one of the first American flags the Germans saw in the dawn of "D" day that now flies from the mast of this new destroyer. Below: W. F. Laughton, general manager of Bethlehem's San Francisco yard bids goodbye to Comdr. Beer, commanding officer of the newly commissioned destroyer.



or it may be turned into a hospital receiving ship or used for rest and recuperation quarters.

Many interesting features designed for the comfort and convenience of her occupants are incorporated into the construction of this ship. Three decks and the hold of the vessel have been arranged to secure the maximum comfort for the occupants. High decks, air conditioning and forced ventilation offer a relief from the tropical heat. Quantities of fresh meats and vegetables are stored in special freezing compartments in connection with the ship's refrigeration system.

Galley and bakery are electrically equipped, including meat cutters, bakery equipment and automatic dishwashers.

Laundry, a big problem in all tropical climates, has been provided for. The ship's laundry has electrical washing machines, clothes driers, special equipment for bath towels and blankets, ironers of all types and other special machinery.

Ships evaporators have a capacity for distilling 1200 gallons of fresh water daily.

Medical facilities include a surgical dressing room, dispensary and laboratory, dental office, sick bay and isolation ward.

Recreation facilities consist of: a large recreation room fitted out with piano, radio, and games; a well furnished library; and an awning covered deck for games and lounging. A barber shop, ship's store, and post office are aboard.

Ample sleeping accommodations are augmented with mess halls, washroom and shower facilities.

The APL-30 is the 40th vessel delivered to the Navy by the Everett Pacific Shipbuilding and Dry Dock Company. Seven others of this type are under construction and will be in service before the end of the year.

...en C-3's for Dutch

The Netherlands Ministry of Shipping and Fisheries on April 16 ordered on behalf of the Netherlands Government ten C-3 type vessels with geared turbine engines to be built by the Sun Shipbuilding and Drydock Company in Chester, Pa.

Construction will be started immediately and the vessels will be delivered at regular intervals between November 1945 and September 1946.



Newswoman Honored At Ingalls Launching

The first war cargo ship to be named for an American newspaperwoman—a C-3 all-welded steel cargo vessel—was christened Kathleen Sexton Holmes.

Mrs. J. E. Gillis, Mrs. Holmes' daughter, was sponsor and Elizabeth Wise, was maid of honor. Edith Gaylord, president of the Women's National Press Club; George S. Holmes, Mrs. Holmes' husband, of Washington; Captain Gillis and Mrs. Pat Harrison, were members of the launching party.

Mrs. Holmes was regular Washington correspondent for the Jackson (Miss.) Daily News, and at the time of her death in December, 1943, occupied a place of prominence in the Washington newspaper women's press corps.

Some Pacific Coast Launchings April 15 to May 15

California Shipbuilding Corporation Wilmington, California

SS Cooper Union Victory, Apr. 19
SS Occidental Victory, Apr. 23
SS Villanova Victory, Apr. 27
SS Southwestern Victory, Apr. 30



Ingalls launching. Left to right: George S. Holmes, husband of Kathleen Sexton Holmes for whom the ship is named; James E. Gillis of Washington, D.C. and the sponsor, daughter of Mrs. Holmes, Mrs. J. E. Gillis. Right: Just before launching.



A new 2200-ton destroyer built at Bethlehem Steel Co. San Pedro yard, on her trial run off the Southern California coast.
(Navy approved Bethlehem Steel Co. photo)

SS Bates Victory, May 2
SS Ouachita Victory, May 8

Commercial Iron Works Portland, Oregon

USS Marietta (AN 82), Apr. 27
USS Hombro (YTB 506), May 1

Consolidated Steel Corporation, Ltd. Long Beach, California

MS Bowline Knot (AV-1), Apr. 17
MS Cat's Paw (AV-1), May 12

Consolidated Steel Corporation, Ltd. Newport Harbor, California

Edward J. Engle (tug), Apr. 28

Consolidated Steel Corporation, Ltd. Wilmington, California

MV Hickory Brook (AV-1), Apr. 16
MV Hickory Crest (AV-1), Apr. 20
MV Hickory Glen (AV-1), Apr. 25
MV Hickory Mount (AV-1), May 1
MV Hickory Isle (AV-1), May 6
MV Hickory Stream (AV-1), May 11

Kaiser Company, Inc., Yard Three Richmond, California

USS General Stuart Heintelman (C4-S-A1), Apr. 21

Kaiser Cargo, Inc., Yard Four Richmond, California

MS Gunner's Knot (C1-M-AV1), Apr. 29
MS Mooring Knot (C1-M-AV1), .. May 11

Marinship Corporation Sausalito, California

SS Dominguez Hills, Tanker, Apr. 18
SS Fullerton Hills, Tanker, May 4

The Permanente Metals Corporation Yard One, Richmond, California

SS St. John's Victory, Apr. 19
SS MacMurray Victory, Apr. 28
SS Northeastern Victory, May 7
SS Fenn Victory, May 15

The Permanente Metals Corporation Yard Two, Richmond, California

SS Trinity Victory, Apr. 18
SS Park Victory, Apr. 21
SS Fisk Victory, Apr. 25
SS Grove City Victory, Apr. 28
SS Hope Victory, May 2
SS Lafayette Victory, May 5
SS Marquette Victory, May 9
SS Hunter Victory, May 12

New Type Coast Guard Fire-Fighters

The first six of a new fleet of radio-equipped fireboats, manned by U. S. Coast Guardsmen, now are on duty protecting waterfront facilities at newly captured ports in the Pacific.

These boats, of an entirely new design, have a length of 40 feet, a beam of 14 feet, and a speed of nine knots. They are capable of delivering 2400 gallons of water a minute from four outlets. The hulls are protected from flames by a continuous spray which dampens the entire craft.

Crews, numbering 10 men, are trained at Manhattan Beach, Brooklyn, N. Y., and are sent overseas with their boats aboard cargo vessels. Already the Coast Guardsmen are laying odds as to who will man the fireboats in the canals of Tokyo.

The boats were designed by Wheeler Shipyards, Inc., Brooklyn, N.Y., according to specifications of Coast Guard engineers. They are equipped with a 130 hp Chrysler Royal marine engine and four 90 hp Chrysler Crown pumping units. The bottom is "V"-shaped and constructed, as throughout the hull, of two half-inch thicknesses of plyboard.

Cancellation of Tanker Contracts

At the direction of the Office of War Mobilization, the U. S. Maritime Commission on April 22 canceled a part of the tanker program awarded in January.

No cancellation is anticipated in existing contracts covering dry cargo vessels, and production of all types of merchant ships is expected to amount to approximately 12,000,000 d.w. tons this calendar year.

Notice of the cancellation of the tanker contracts was sent to the following yards:

Alabama Dry Dock & Shipbuilding Company, Mobile, Alabama—5 canceled—leaving 21 to complete.

Welding Shipyards, Inc., Norfolk, Virginia—1 canceled—leaving 1 to complete.

Sun Shipbuilding & Dry Dock Company, Chester, Pennsylvania—13 canceled—leaving 32 to complete.

Marinship Corporation, Sausalito, California—5 canceled—leaving 13 to complete.

Kaiser Company, Inc., Swan Island Yard, Portland, Oregon—6 canceled—leaving 29 to complete.

A Triple Event at Marinship

The entire construction cycle of a tanker was enacted in a single day on April 25, when workers at Marinship Corporation, in Sausalito, took part in a keel laying, a launching, and



New type at Coast Guard Fire-Fighter

From the oily waters of Pearl Harbor to the coral ledges at Saipan and Guam, these boats will help protect Uncle Sam's vital wartime shipping and docking facilities. It is probable that C.G. fire boats will be assigned to Manila and other large ports that fall into Allied hands.

a delivery—all within six hours.

Keel was laid for the Navy oiler USS Conecuh at 5:00 p.m., just a short time after the merchant tanker Paloma Hills had been launched from the same way at 12:30 p.m. The tanker Santa Fe Hills had been delivered into maritime service at 11:00 a. m.

April Shipbuilding Record

Thirty-two merchant shipyards turned out 103 ships with a total of 1,004,073 d.w. tons during the month of April.

The 103 ships consisted of 34 Victory cargo ships, eight Liberty cargoes, eight C-type vessels, two colliers built on the Liberty hull design, one refrigerated cargo, 20 coastal cargo ships, one private tanker, 16 standard tankers, and 13 military type ships.

Largest group of vessels was built in West Coast yards, with 47 vessels having an aggregate of 486,858 d.w. tons, or 48.5 per cent of the total d.w. delivered during April. East Coast yards delivered 29 ships, the 300,733 d.w. tons being 30 per cent of the total.

Ships delivered from U. S. Maritime Commission yards during April follows:

Yard	Number	Type
Alabama D. D. & Shpbldg. Co., Mobile, Ala.	4	T2 Tankers
Avondale Marine Ways, Inc., Westwego, La.	1	N3 Coastal Cargo
Bethlehem-Alameda Shipyard, Inc.	1	Military Type
Bethlehem-Fairfield Shipyards, Inc.	6	Victory Cargo
Bethlehem-Sparrows Point	1	Pvt. Tanker
Calship, Wilmington, Calif.	8	Victory Cargo
Consolidated Steel Corp., Wilmington, Calif.	1	Military Type
Consolidated, Long Beach, Calif.	2	C1-M-AV1 Coastal Cargo
Delta Shpbldg. Co., New Orleans, La.	2	Liberty Colliers
Federal, Kearny, N. J.	2	Military Type
Froemming Bros., Milwaukee, Wis.	1	C1-M-AV1 Coastal Cargo
Globe, Superior, Wis.	1	C1-M-AV1 Coastal Cargo
Ingalls Shpbldg. Corp., Pascagoula, Miss.	2	C3 Cargo
Ingalls, Decatur, Ala.	1	N3 Coastal Cargo
J. A. Jones, Panama City, Fla.	3	Liberty Cargo (baxed plane carriers)
Kaiser Cargo, Richmond #4, Richmond, Cal.	2	C1-M-AV1 Coastal Cargo
Kaiser Co., Richmond #3, Richmond, Cal.	4	Military Type
Kaiser Co., Swan Island, Portland, Ore.	4	T2 Tankers
Leathem D. Smith, Sturgeon Bay, Wis.	2	C1-M-AV1 Coastal Cargo
Marinship, Sausalito, Calif.	2	T2 Tankers
McCloskey & Co., Tampa, Fla.	2	N3 Coastal Cargo
Moore Dry Dock Co., Oakland, Calif.	2	C2 Cargo
	1	R2 Refrigerated Cargo
North Carolina, Wilmington, N. C.	4	C2 Cargo
New England Shpbldg. Corp., S. Portland, Me.	5	Liberty Cargo
Oregonship, Portland, Ore.	9	Victory Cargo
Pennsylvania Shipyards, Beaumont, Tex.	1	R1-M-AV3 Coastal Cargo
	2	C1-M-AV1 Coastal Cargo
Permanente Metals Corp., Richmond, Calif.	3	Victory Cargo
Permanente Metals Corp., Richmond, Calif.	8	Victory Cargo
Sun Shipbuilding & D. D. Co., Chester, Pa.	6	T2 Tankers
	1	Military Type
Walter Butler, Duluth, Minn.	2	C1-M-AV1 Coastal Cargo
Walter Butler, Superior, Wis.	3	C1-M-AV1 Coastal Cargo
Walsh-Kaiser, Providence, R. I.	4	Military Type



This action picture shows the formal signing over of the tanker Elwood Hills at Marinship Corporation, the shipyard setting a new world's record for speedy tanker construction, by delivery 59 days after keel laying. Left to right: Ray L. Hamilton, production mgr. of yard; George A. Patterson, princ. mach. insp. officially accepting the ship for USMC; William Taylor, port engineer, Pacific Tankers, Inc.; Sydney Ford, Marinship Documentation Officer; Allen Cameron, Port Captain, Pac. Tankers, Inc. and Elvira Hannevig.

Todd Endows Scholarship In Naval Architecture

Todd Shipyards Corporation has endowed a resident scholarship at the Webb Institute of Naval Architecture, to be awarded in competitive examinations open to Todd employees or sons of employees.

The course, normally four years, but compressed by war conditions to about three years, leads to a Bachelor of Science degree.



This rosor-edged victory V with a bulbous bottom is the bow of the U.S.S. Naval cruiser Juneau, under construction at U.S. Steel's Federal shipyard at Kearny, N.J. As she stands, the bow is four stories, or 49 feet, high and weighs 37½ tons.

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Low Maintenance Cost of Heavy Duty Diesels

(Continued from page 351)

business to the log-towing service. Up to 1910 the fleet consisted entirely of steam stern wheelers. In that year they bought their first gasoline-powered towboat, the Echo, a 65-foot launch powered by a 125-hp Imperial gasoline engine. At that time the relationship between this prominent towing concern and an engine builder known as the Atlas Imperial started, and has been continuous for 34 years. The Atlas Engine Co. and the Imperial Gas Engine Co., which were finally merged, were both builders of gasoline engines, and in 1914 produced their first diesel. It did not, however, go to the Shavers, but was built for stationary service in a mine which later failed, and the engine was then installed in a ferryboat called The Islander, now operating in Southern California. That same engine is still running daily in the same ferry.

Always alert to any advance which might improve their service and lower their power costs, the Shavers kept a weather eye on the diesel development of the Atlas concern, and in 1923 they bought a 90-hp Atlas diesel for the Echo. The new diesel proved reliable in performance, its operating cost was low, and the maintenance was negligible. In just one year of successful experience they were convinced that the diesel engine was a reliable source of power, and late in 1923 they bought a 300-hp Atlas diesel for their new 77-foot James W, built by the Portland Shipbuilding Company from designs of J. H. Johnston. Two more years' experience and they installed in their steam towboat Pearl a 200-hp Atlas diesel. In 1926 they converted the steam stern wheeler Shaver into a tunnel stern, twin screw Atlas diesel-powered vessel, as noted earlier in this article. In 1926 they also added the 90-hp boat Charm to their fleet, and in 1930, through consolidation with the Smith Transportation Co., they added Atlas-powered tugs Wilavis, 250 hp; Wampus, 50 hp; Smith, 400 hp; Deck Boy, 65 hp; and Norah, 75 hp.

In 1934 the Shaver company bought the Hosford Transportation Co., acquiring two more Atlas-diesel-powered vessels, the Cruiser, 350 hp, and Olin W, 110 hp. In 1937 the Shavers acquired the Geo. H. Mendell from the U. S. Engineers, employed her for towing service, and powered her with a 480-hp Atlas diesel for propulsion and a 40-hp Atlas diesel auxiliary. The vessel was renamed the George W and put in service towing the rock barge Mastodon from Longview to Fort Canby. She handled over the period of this work 450,000 tons of rock for the rebuilding of the north jetty of the Columbia River and Jetty A, never missing a trip except one, and that due to fog conditions.

Over a period of 16 years the Shavers purchased 16 new Atlas diesels, and the management says today: "If you will give an Atlas diesel engine reasonable attention, you will not only have ample dependable power, but your maintenance cost over a period of years will be remarkably low."

The management of the Shaver Transportation Co. today includes: Captain Delmer Shaver, president; Captain Leonard R. Shaver, vice president; Captain George M. Shaver, treasurer; Captain Homer T. Shaver, secretary and general manager.

Airborne Rescue Boat Construction

(Continued from page 330)

rough for patrol seaplanes to land and pick up the survivors. Once contact is lost with these small boats, to relocate them is like finding the proverbial needle in the haystack.

The flying rescue boat grew out of the need for larger, rigid boats which would improve the chances of survival for men lost at sea. In outlining plans for this boat, it was agreed that a primary requisite should be that the boat be large enough to accommodate at least eight men in comfort; that it be completely seaworthy and practically unsinkable; and that it be stocked with food, medicines and radio equipment so that cruises as long as 1500 miles would be possible.

Future of Concrete Shipbuilding

(Continued from page 329)

(2) The completed structure can be of an absolutely monolithic character.

(3) All form work can be eliminated.

(4) Structural members can be shaped for equality of stresses throughout.

(5) Mix can be designed specifically for the purpose.

(6) Mix can be applied in successive layers.

(7) Reinforcing steel will be all pre-assembled in sections as large as desired.

It is my thought that (taking advantage of all the improvements at our disposal in the science of concrete ship structural design and concrete ship construction methods) it will be possible to build concrete ships for specific purposes at a decided advantage over similar ships built of either steel or wood.



Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

Seattle Celebrates Maritime Day

Parades, a Victory ship open house, receptions and other festivities were the order of the day which was climaxed with a banquet, sponsored by the Seattle Propeller Club and the Seattle Chamber of Commerce, as Seattle observed Maritime Day on May 22.

Vice Admiral Howard L. Vickery, USN, vice chairman, U. S. Maritime Commission, and Deputy War Shipping Administrator, spoke at the banquet and gave high praise to the production accomplishment of Puget Sound firms engaged in work connected with the Maritime Commission's shipbuilding program. The many prominent men of maritime affairs in attendance at the dinner heard of Great Britain's shipbuilding program from Sir Amos Ayre, KBE, director of merchant shipbuilding. Both Sir Amos and Vice Admiral Vickery told the assemblage of their countries' future merchant shipbuilding plans.

Earlier in the day a parade featuring floats of Maritime Commission prime contractors, subcontractors and suppliers, traversed Seattle streets receiving applause from shipping-minded Seattle citizens who lined the sidewalks. The Victory ship open house began at noon and continued until eight o'clock.

Manufacturers of marine equipment participating in the parade included: Asbestos Supply Co.; Berger Engineering Co.; M. F. Buchman Machine Co.; Doran Company; Instrument Laboratories Inc.; Isaacson Iron Works; Markey Machinery Co.; Olympic Steel Works; Pacific Car & Foundry Co.; Seattle Chain & Mfg. Co.; Seidelhuber Ornamental Iron Works, Sternoff Metals Iron Works; Stetson - Ross Machine Co.; United Seamen's Service; Viking Marine Co.; Webster-Brinkley Co.; Westinghouse Electric Co.; Western Gear Works; and Young Iron Works.

General chairman of Seattle's Maritime Day program was James Griffiths who received many compliments on the exceptional organization job the committee performed in making the celebration one of the most outstanding in the country.



Vice Admiral Howard L. Vickery, USN (retired), vice chairman, U. S. Maritime Commission and Deputy War Shipping Administrator.

SHIP

A ship is made by heavy steel,
Of countless things from bridge to keel.
But, 'tis the simple truth I pen—
The heart and soul of ships—are men.

Edgar A. Guest.





At top, left: Commissioner Edward Macauley pinning the Distinguished Service Medal on Chief Engineer Howard Quinn.

Right: The Commissioner about to decorate Cadet-Midshipman William Mitchell with a Mariner's Medal, who was injured at Manila on December 8, 1941, and who spent 3 years in Japanese prison camp.







Upper left: Commander W. Creighton Peet, Jr., of WSA; Ernest Ingold (representing Henry F. Grady) former pres. of Chamber of Commerce; and J. W. Maillard, pres. Board of State Harbor Commissioners.

Center: Joseph Geary, past pres., S. F. Commercial Club; Hubert Brown, Junior Chamber of Commerce, on Natl. Maritime Day Committee, and E. Russell Luts of American President Lines.

Lower left: Commander Roy Word; O. C. Hansen, president of Foreign Trade Assn. of C. of C; and William J. Howe.

San Francisco Celebrates MARITIME DAY

National Maritime Day marked the climax of a five-day celebration in San Francisco on May 22.

The SS American Seafarer, one of a fleet of USMS training ships, and commanded by Commander W. E. Porter, USMS, docked at the special Maritime Day building at the Ferry Building and was opened from Friday through Tuesday. To stimulate the sale of bonds for the 7th War Bond Drive, a conducted tour of the ship was provided for every purchaser of a bond. The Women's Organization for the American Merchant Marine participated in this bond sale, with gratifying results.

During the morning of May 22, Commissioner Edward Macauley, USN (Ret.), Deputy Administrator of the War Shipping Administration and Commissioner of the U. S. Maritime Commission, officiated at the USMM Cadet Corps Memorial ceremony, conducted on the center of the Golden Gate Bridge, in honor of all merchant seamen lost in the Pacific. Commissioner Macauley cast a wreath into the waters below the bridge in honor of these seamen. Officers and guests of the Training Organization units on the west coast and shipping executives attended.



Rear Admiral C. A. Wright, John Cushing, Captain H. J. Tiedemann, USMS, Pacific District Operations Officer, and Joseph A. Moore, Jr.

At noon, Commissioner Macauley gave a special address before a luncheon group at the Commercial Club. Traditionally the highlight of San Francisco's National Maritime Day, the gathering was attended by many civic, shipping and military leaders.

During the luncheon Commissioner Macauley presented a Distinguished Service Medal to Chief Engineer Howard Quinn for heroic action during the sinking of the SS President Coolidge, and a Mariner's Medal to Cadet-Midshipman William Mitchell, who was injured at Manila on December 8, 1941, and spent three years in a Japanese prison camp.

On the afternoon of National Maritime Day, Captain H. J. Tiedemann, USMS, Pacific District Operations Officer, presented a "Certificate of Appreciation" to the Women's organization during an open house reception at the USMS Center, 1000 Geary Street, for their work in developing and operating "Davy Jones Locker," the canteen at the Center.

Crew of American Seafarer at attention during inspection. Coming down the line are Commodore Telfair Knight, USMS; Commander W. E. Porter, commander of USMS training ship, American Seafarer; Captain Tiedemann, and Captain Crossman.
Below: Behind the 7th War Bond Drive are the Women's Organization for the American Merchant Marine members selling bonds during Maritime Day week. Left to right: Mrs. Bernard De Rochie, Mrs. A. Pittman and Mrs. White (in bond booth), Mrs. James S. Hines and Captain Henry Blackstone, bond purchasers.





Invitation to a Seafarer Cruise

Pacific Marine Review

Gentlemen:

As an incentive to boost War Bond sales, the War Finance Committee of Southern California has offered a one day ocean cruise on the USMSTS American Seafarer to any Southern California retail store employee who sells $5000 worth of bonds.

There will be six such cruises on successive Mondays, beginning May 28 and ending July 9. One hundred persons will be taken on each cruise. While under way all guests will be conducted on a complete tour of the ship, observing seaman training in all its phases.

We would like to extend to your representative a cordial invitation to visit this vessel and make one of our bond cruises.

Very truly yours,
W. E. Porter (signed)
Commanding Officer
Training Ship American Seafarer.

"Davy Jones Locker"

Reception Maritime Day



At right: Captain H. J. Tiedemann, USMS, presenting the "Certificate of Appreciation" plaque to Mrs. Earle H. Carder, retiring president of WOAMM, for the Club's wark at USMS canteen.

Top, left: "Look at that gold braid," exclaims Dr. Robert Laddan to Mrs. Pearl Cook while Mr. Rosekrans, Mrs. Laddan and Mr. I. N. Rosekrans look on.

Center: The "Harmonettes" from Richmond shipyards singing to a group of USMS seamen during reception at "Davy Jones Locker."

At bottom: Captain H. J. Tiedemann, USMS, Pacific District Operations Officer, Admiral Philip F. Roach, (ret.) USCG, and Captain W. E. Porter, commander of American Seafarer at the reception.











Center, right: Miss Elisabeth Magee, Mrs. Allan Toole, Edgar Martin of Westinghouse Electric Co., Mrs. Earle H. Carder, Mrs. Hugh Gallagher, Captain Ed C. Holden, co of USS Starlight, just back from Okinawa; Mrs. J. F. Harvey, Mrs. Harry W. Parsons and Mrs. Clay Bedford.

Below: Behind the serving table are Senora J. Gusman-Cruchaga, wife of Chilean Consul and delegate to Conference; Mrs. Clay Bedford, Mrs. Carl W. Flesher, Mrs. John Hayes and Mrs. Allan Toole.





V-E DAY AND THE FIRST ANNIVERSARY OF THE WOMEN'S ORGANIZATION FOR THE AMERICAN MERCHANT MARINE WERE CELEBRATED ON THE SAME DAY.

Honored guests were Mrs. Alma de Bretteville Spreckels, who is instigator of the San Francisco League for Service Men, and Mrs. Ann F. Dippel, president of the S. F. Women's Chamber of Commerce.

Guests at the first anniversary reception were, left: Mrs. Vernon Stipe, guest of club from Seattle, with Mrs. Phyllis Calsae and Mr. and Mrs. L. G. Rummel. At right: Mrs. Earle H. Carder, Eugene Hoffman, secretary of S. F. Propeller Club, and Mrs. Ann F. Dippel being served a piece of anniversary cake.

NATIONAL MARITIME DAY IN LOS ANGELES









High light of National Maritime Day program in Los Angeles area was the presentation of a Charter of The Propeller Club of the United States to the University of Southern California. This new group at USC is to be known as Port No. 97. An impressive ceremony was conducted before a throng of friends of the Merchant Marine at Philharmonic Auditorium in Los Angeles.

Among those present who played a prominent part in the success of the day were: (1) L. K. Vermilie, center, president of Propeller Club, Port of Los Angeles-Long Beach, discusses the program with Lee Archer, program chairman, left, and A. L. Allyn. (2) Left to right: J. H. Hadfield, Leonard Backus, A. L. Allyn, Lee Archer and Ralf Monsen. (3) "Miss National Maritime Day" Lynne Bagget with Colonel John Kilpatrick, Los Angeles Port of Embarkation and Rear Admiral Albert W. Marshall, USN, (Ret.). (4) Ever busy Secretary Howard Woodruff checks in Lisle M. Gray, president of the Foreign Trade Assn. at the National Maritime Day program.

Los Angeles Bilge Club Elects Officers





Top left: Al Boro was named vice chairman of the Bilge Club, the first action of President R. W. "Duke" Decker, center, and Bob Snodgrass, secretary of the Bilge Club.

At left: R. W. Decker, newly elected president of the Bilge Club receives congratulations of T. W. Buchholz, retiring president, following announcement of election at the Pacific Coast Club, Long Beach.

The Bilge Club of Los Angeles Harbor held its annual meeting and election of officers on May 1 at the Pacific Coast Club in Long Beach. The gathering was one of the best attended and most successful dinner meetings of the year.

The new president is Ralph W. "Duke" Decker, assistant manager of Red Stack tugs. The retiring president, T. W. Buchholz, was accorded a great ovation for a highly successful tenure of office as he turned over the gavel to new chairman Decker. One of the first acts of the new president was to issue the annual call for the Bilge Club Barbecue to be held at the Palos Verdes Country Club on June 23.

Al Boro was elected to a new post, that of co-chairman; treasurer for the new year is Winn Rash; and Robert Snodgrass was re-elected secretary of the Club. The new Board of Directors is as follows: Ralph "Duke" Decker, president and chairman; Al Boro, co-chairman; Earl Archibald; Floyd Nelson; Walter C. Richards; Commander William Mason, USN (Ret.); Hal Bowen.

George E. Swett Promotions

George E. Swett & Co., engineers of 58 Main Street, San Francisco, announced the following appointments effective April 1: **W. J. Kinney,** superintendent; **Duward Frost,** assistant superintendent in charge of marine refrigeration service; **H. N. Craig,** manager of purchases and stores; **Irving Fairbanks,** sales engineer.

All four men are experienced marine refrigeration engineers and have been engaged in the installation of marine refrigeration plants, with the master contractors, on both U. S. Navy and Maritime Commission work.

Under this new arrangement Kinney and Frost will be in direct charge of all installations and servicing. Craig, who has had wide experience in the industry, especially in the materials department, will have charge of all purchases and stores. Fairbanks will be the sales engineer.

Five Stars for Nordberg

Nordberg Manufacturing Co. of Milwaukee, Wis., has been given their fifth award for their Navy "E" pennant, which now carries five stars. They have also received the fourth award for their Maritime "E" pennant, since this burgee originally carries one star, this makes five stars for it, also.



Promotions at George E. Swett & Co. Left to right: Irving Fairbanks, sales engineer; W. J. Kinney, superintendent; H. N. Craig, manager of purchases and stores; and Duward Frost, asst. supt. in charge of marine refrigeration service.



Leading construction and shipbuilding figures of the West were present at the Marinship Corporation launching of the tanker Paloma Hills on April 25, which was christened by Mrs. K. K. Bechtel. L to R they are: William E. Wooste, Brantley M. Eubanks, Stephen D. Bechtel, Jerome Doolan, Kenneth K. Bechtel, John A. McCone, Felix Kahn, Warren A. Bechtel, and Harold C. Price.

Babcock & Wilcox's Additional Vice Presidents

Auguste G. Pratt, president of The Babcock & Wilcox Company, announced that the Board of Directors had elected two additional Vice Presidents, **Alfred Iddles** and **J. H. King.** Mr. King has been manager of the Marine Department of the company since 1932, and Mr. Iddles, special assistant to the Vice President in charge of engineering.

Mr. King has also served as assistant manager of the Marine Department. As vice president, he will continue to head the company's marine activities having direct charge of the firm's extensive program of furnishing marine boilers for the Navy and Maritime Commission war schedules. He has contributed a number of papers before technical societies and to the technical press and is an official of The Society of Naval Architects and Marine Engineers, a member of the American Society of Naval Engineers, and the Institute of Marine Engineers, London.

Mr. Iddles has been associated with the firm since 1937, and has had charge of the Service and Service Engineering Department which provides the functional design of boilers and fuel-burning equipment. His work has taken him all over the United States to deliver many scientific and technical papers before national and other engineering and scientific societies.



J. H. King, newly elected vice president of The Babcock & Wilcox Company.

Duke University Presents Ship With Library

Duke University in Durham, North Carolina, is receiving the plaudits and appreciation of the crew and officers of the new SS Duke Victory, recently turned over to Pope & Talbot, Inc., McCormick Steamship Division, by War Shipping Administration, for a compact, though comprehensive, library. **John A. Lunny,** vice president and director of operations, waxes enthusiastic over the prized volumes and reports, "that Captain Conrad is highly pleased with the completeness and scope of the hundred and fifty volumes with which the Duke Victory has been endowed."



"A lift to morale," exclaimed Captain Conrad of Pope & Talbot-McCormick Steamship SS Duke Victory, inspecting the library gift by Duke University.

APL Receives Award From Medical Society

Henry F. Grady, president of the American President Lines, has just been advised of a signal honor bestowed upon his company by the American College of Surgeons.

Recognition of the big West Coast shipping company came in the form of a "Certificate of Merit" which represents the highest award within the gift of the American College of Surgeons "for maintenance of satisfactory standards in industrial medicine and surgery."

The award is the first of its kind ever presented to an American flag steamship company, and is regarded as a personal tribute to Dr. Rodney A. Yoell of San Francisco, who heads up American President Lines' medical staff as chief surgeon.

Dr. Yoell won wide acclaim in 1943 with publication of his book "The Ship's Medical Manual," which has become a standard guide book for the maintenance of good health on board freighters and other vessels whose crew complement does not include a medical officer.

The certificate presented to American President Lines was authorized by the Board of Regents of the College of Surgeons and signed by Dr. W. Edward Gallie, president, and Dr. Irvin Abell, chairman of the board.



Nita Bolin holds Medical Award Certificate from American College of Surgeons presented American President Lines.



ALBINA PAST and PRESENT CHIEFS

Left to right: George Rodgers, retiring president of Albina and L. R. Hussa, new president.

Albina Shifts

L. R. Hussa, one of the Pacific Coast's most prominent shipbuilders and naval architects, was recently appointed president of Albina Engine and Machine Works. He succeeds George Rodgers, longtime president of the firm, who is retiring from the shipbuilding business. Hussa has served Albina since 1922, being for many years executive vice president and general manager of the Portland firm. Previous to coming to Portland, Husa was with the Todd Shipbuilding Co. in Tacoma.

On May 10 Albina Engine and Machine Works launched the SS Oregon Fir, first of four lumber cargo vessels for the maritime commission. This type vessel, designed by L. R. Hussa, is a steel coastal lumber motorship, 317 feet in length, destined for wartime service and for post-war lumber trade. The ship is designed to carry over two million board feet of lumber and is powered by 1200 hp diesel engines. Mrs. Robert Farrell Jr., wife of Oregon's Secretary of State, sponsored the vessel.



Left to right: Ralph H. Schlosser and C. M. Bovard of Cooper-Bessemer Corporation.

Cooper-Bessemer Veterans Promoted

Promotion of **C. M. Bovard** from the position of chief draftsman to Design Engineer and the elevation of **Ralph H. Schlosser** to Chief Draftsman is announced by The Cooper-Bessemer Corporation, diesel engine and compressor manufacturer.

Mr. Bovard is a veteran of 20 years of service and Mr. Schlosser has served in the company's drafting room for 31 years.



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Moore on Shipbuilders Council

Joseph A. Moore, Sr., chairman of the board, Moore Dry Dock Company, has been elected a director of the Shipbuilders Council of America at the group's annual meeting in New York.

H. Gerrish Smith, president, was re-elected, as were Vice President Roger Williams and Secretary-Treasurer Clifford C. Knerr.

Directors elected are:

For three-year term expiring March 31, 1948—L. Y. Spear, president, Electric Boat Company; L. H. Korndorff, president, Federal Shipbuilding & Dry Dock Company; H. L. Ferguson, president, Newport News Shipbuilding & Dry Dock Company; A. B. Homer, vice president, Bethlehem Steel Company, Shipbuilding Division; George H. French, president, The Maryland Drydock Co.; John D. Reilly, president, Todd Shipyards Corporation.

For two-year term expiring March 31, 1947—Monro B. Lanier, president, The Ingalls Shipbuilding Corp.

For one-year term expiring March 31, 1946—Alden G. Roach, president, Consolidated Steel Corp, Ltd., Shipbuilding Division; R. E. Banks, Southeastern Shipbuilding Corp.; H. E. Rossell, president, Cramp Shipbuilding Company; J. A. Moore, Sr., Moore Dry Dock Company; George Howell, president, Tampa Shipbuilding Co., Inc.; C. W. Middleton, vice president, The Babcock & Wilcox Co.

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John L. Chaney Ship Clinometers are not affected by weather, climate or atmospheric conditions. They can be placed anywhere on board,—in the engine room—on the bridge—in the chart room—in the hold—wherever list or roll must be checked frequently. Many vessels have a number of these precision-built navigating instruments throughout the ship.

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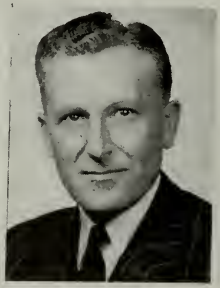
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SHORESIDE PERSONALITIES

F. A. Abraham has been named marine superintendent at Swan Island Shipbuilding Corp., adding these duties to his position as Marine and Outfitting superintendent at Oregonship, according to announcement of Superintendent Elmer Hann. He succeeds at Swan C. H. McEachron, who resigned because of ill health. Mr. Abraham started at Oregon Shipbuilding Corporation as marine superintendent when the yard was built.



Peter L. Lenz has been appointed Pacific Coast manager for Westinghouse Manufacturing and Repair Department, headquarters at Emeryville, California.

Alden G. Roach, president of the Consolidated Steel Corporation, announced election of **Charles W. Crawford** as a vice president of the Los Angeles headquarters. Crawford was formerly manager of Consolidated's Naval Ordnance Division. He is now in charge of engineering development and research.

Vice Admiral Howard L. Vickery made his first visit to the Pacific Coast since his severe illness of a year ago. He came to the Pacific Coast in company with Sir Amos L. Ayre, head of the British Commission of Shipbuilding, to make the principal talk at the Seattle Maritime Day dinner on May 22.

From Seattle Vice Admiral Vickery went to Portland to inspect the Kaiser yards then he headed for San Francisco where he visited the shipbuilding concerns that have built nearly 1,000 ships in the Bay Area since January 1941, aggregating nearly 10,000,000 deadweight tons. From the Golden Gate he went south to inspect Consolidated Shipbuilding Corp. and California Shipbuilding Corporation.

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SAN FRANCISCO — Curtiss Bros., 201 Harris St.—Douglas 8590
VANCOUVER, B. C. — Engineering Service Ltd., Rose Bldg.—Pacific 3434

Captain J. E. Brenner, USN, of San Francisco, was named by Governor Warren last month as a member of the board of governors of the California State Nautical School.

Shepard Steamship Company held their annual meeting in Boston and elected the following officers: President, Thomas H. Shepard; Vice President and Secretary, Horace W. Shepard; Treasurer, Otis N. Shepard; Comptroller, John A. Geishecker.

Before the war the company operated a fleet of freighters intercoastal.

After spending a short vacation on an island he owns on Puget Sound, **Captain Harold B. Ferris,** veteran member of the Matson Navigation Company, has returned to Navy duty. He was skipper of the Liberty ship Mark Hopkins when this vessel was part of the invasion fleet at Normandy.



Captain Arthur J. Kenney of SS West Kyska is brother of famed Air General Kenney serving with MacArthur in Pacific.

PMR Hears From Curtis B. Johnson

As we go to press we have a nice letter from Curtis B. Johnson, well-known Pacific Coast marine engineer, and whose home was over in Alameda before the war. Curtis writes that he has been transferred to the Corps of Engineers and is going to be Chief Engineer on a salvage port repair ship. His rank is now that of Captain. That's going "up the line," Curtis, congratulations!

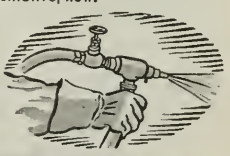


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C. S. Beesemeyer, seated, newly appointed vice pres. and director of marketing of the General Petroleum Corporation, is shown at his first conference with his newly formed executive staff. Standing, from l to r: John C. Sample, now gen. mgr. of Marketing Dept.; Herman Alber, asst. gen. sales manager in charge of wholesale sales; and C. H. Wartman, asst. gen. sales mgr. in charge of retail sales.

SHORESIDE PERSONALITIES

Friends are congratulating **Captain Arthur E. Paulson,** well known in San Francisco shipping circles, upon his assignment to the Marine Operations branch of the Port of Embarkation at San Francisco.

Captain Paulson saw duty in the Aleutians for more than two years before coming to this port. He was associated with Snowden Transportation Company before the war.

Captain John T. Greany, Jr., son of the general sales manager for the Bethlehem Shipbuilding Corp. with offices in San Francisco, was awarded the purple heart for injuries sustained in the Italian war sector.

The Maritime Commission announced the following resignations and replacement of executives:

Christian H. Lundegaard became acting director of East Coast Construction following the resignation of J. F. McInnis, director, with headquarters in Philadelphia. Lundegaard served with the Federal Shipbuilding Company, Kearny, N. J., from 1920 until he resigned to join the Maritime Commission on June 1, 1938, as a naval architect.

J. Duncan Holmes has been named by Burton L. Hunter, of the recently created Contract Settlement and Surplus Materials Division, to be in charge of the activities on the Atlantic Coast with offices in Philadelphia.

Admiral R. E. Ingersoll, USN, commander of the Western Sea Frontier, presented **Commodore Milton S. Davis,** USN (retired) with the Distinguished Service Medal upon the latter's retirement as port director and as regional shipping director.

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Announcing the appointment of Mr. Edward Dorresten as General Meneger of the company.

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Providing an exceptional service to the Marine Industry in the construction, reconversion and repair of merchant and naval vessels with

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Since 1924

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SHORESIDE PERSONALITIES

James E. Guillet, formerly with the Pollock-Stockton Shipbuilding Co., is now operating manager for the Pipe Engineering Company of Stockton.

Pipe Engineering Company specializes in refrigeration, scientific instruments, machine work, pipe and metal fabrication, electric motor work and other marine installations.

Captain Hewlett R. Bishop, who had been senior port captain and manager of cargo operations for the Maritime Commission, Atlantic Coast District, was named Acting Atlantic Coast director for WSA, succeeding the late **Walter H. Swenk.**

Captain Bishop began his sea career in 1923, coming up through the ranks from seaman to master. He served as executive officer with the Roosevelt Steamship Company (United States Lines) on such vessels as the Washington, Manhattan and America.



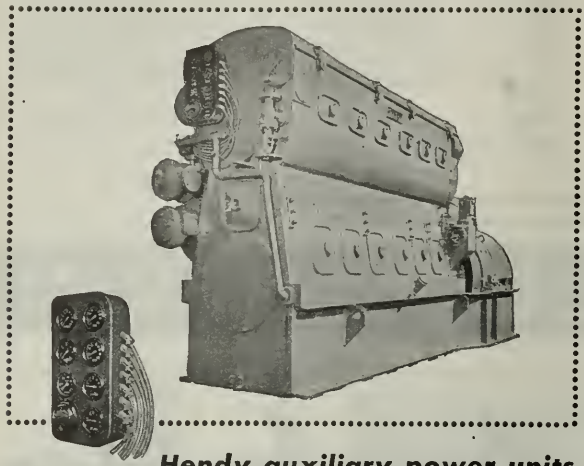
Walter Dorwin Teague, dean of American industrial Designers.

Industrial Designer Opens West Coast Offices

Walter Dorwin Teague, long known as the Dean of American Industrial Designers, has extended the services of his organization to the Pacific Coast. The new Teague offices are located in the Title Guarantee Building, Los Angeles. "The present expansion of West Coast Industry," says Teague, "not only can be made permanent, but can serve in addition as the basis for more intensive industrialization of this area and for all of the countries facing the Pacific Ocean." It is the West's position, he says of unquestioned leadership in the fields of light metals, aircraft construction and air transportation and in the manufacture of kindred products that has prompted the move to supplement the operations of the Teague New York organization.

New F W Directors

Three new directors were elected to the Board of the Foster Wheeler Corporation recently, each of whom had worked his way up to a position of importance in the company. These new men on the Board are: William L. Martwick, vice president in charge of general sales who joined Foster Wheeler in 1926; Lee A. Swern, patent counsel to the Corporation since 1936; and Charles E. McCulloch, manager of the Foster Wheeler Petroleum Refinery Division who joined that division in 1927.



Hendy auxiliary power units are equipped with

***Alnor* Pyrometers**

A familiar sight on the instrument panel of modern Diesel equipment is the Alnor Exhaust Pyrometer. These 250 kw. Diesel generator sets built by Joshua Hendy Iron Works are no exception. Two of these units are used in Maritime Commission Type C1-M-AV1 Cargo Ships, providing auxiliary power, and are equipped with Alnor Pyrometers. Dependable exhaust temperature indications provided by the Alnor Pyrometers afford a reliable check on proper loading and efficient performance of the engine. Afloat or ashore, you will find Alnor Pyrometers rendering unfailing service with Diesel and gas engines of many types. Write for Alnor Pyrometer bulletins with complete data.

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KINNEY ROTARY CARGO PUMPS

The story of the former Texaco tanker "Ohio" is an epic of the war. Her gunners shot down dozens of enemy planes. Though dive-bombed and shelled, she fought her way to Malta and delivered a cargo of desperately needed aviation gasoline. We are proud that this stout ship, like many other tankers, has KINNEY Heliquad Pumps on board to handle her cargo.

Ships of many types depend on KINNEY Pumps which are ruggedly built to stand up under exacting marine conditions.

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Luncheon for Commander Stassen

Commander Harold E. Stassen on May 17 addressed a capacity audience of San Francisco Chamber of Commerce and Commercial Club members at a luncheon in the Club. Commander Stassen, U. S. Delegate to the United Nations Conference, commented on the purposes and progress of the Conference thus far.

Former governor of Minnesota, first elected in 1938, Commander Stassen is the youngest governor in the history of the state of Minnesota, and currently the youngest in the United States. He was elected governor of his state for three consecutive terms, but resigned during his third term to enter the U. S. Navy.

New Westinghouse Treasury Manager

John J. Hayes, of Seattle, Wash., and long associated with Westinghouse Electric Company there and in Chicago, Ill., has been appointed Westinghouse Pacific Coast district treasury manager. In his new post Mr. Hayes will have charge of activities of the Westinghouse Treasury Dept. in an area comprising all or parts of nine western states, Alaska and Hawaii.

Mr. Hayes is widely known in banking and business circles in the Pacific Northwest and the Middle West. He is a member of the National Association of Credit Men and other organizations.



John J. Hayes, new Pacific Coast manager at the Treasury Department, Westinghouse Electric Corporation.

Consolidated Steel Elects Vice President

Charles W. Crawford, who was formerly manager of Consolidated's Naval Ordnance Division, has been elected a vice president of Consolidated Steel Corporation of Los Angeles and put in charge of engineering development and research.

Mr. Crawford has been with the corporation since 1933.

Wrought Iron Distributor

A. Milne & Company has been named national distributor for wrought iron bars manufactured by A. M. Byers Company, Pittsburgh. The Milne organization, one of the largest distributors of iron and steel in this country and, before the war, the largest distributors of Swedish and Norwegian irons, operates warehouses in New York, Boston, Chicago, Pittsburgh and Philadelphia, and also an office in Washington.

Tackle THE JOB WITH BESTCO BLOCKS



BESTCO MARINE BLOCKS are designed and built of carefully selected materials by highly skilled craftsmen with exacting care to meet the tough, gruelling wartime service of the merchant marine and the U. S. Navy.

BESTCO MARINE BLOCKS are available in all standard sizes and can also be furnished to suit any special requirements.

BESTCO MFG. CO.

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***U.S.S. TANGIER,** A SEAPLANE TENDER, WHOSE GUNS WERE FIRST TO ANSWER THE JAPS AT PEARL HARBOR. HER AIRPLANE CRANE MACHINERY WAS DESIGNED AND BUILT BY*

C. H. WHEELER OF PHILADELPHIA



OFFICIAL U. S. NAVY PHOTOGRAPH

C. H. Wheeler products serving on Navy and merchant vessels include airplane and boat cranes, capstans, anchor windlasses, winches, steering gear, boat and whip hoisting units, surface condensers, and steam jet air ejectors.

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TYPES: Centrifugal • Reciprocating • Self Priming

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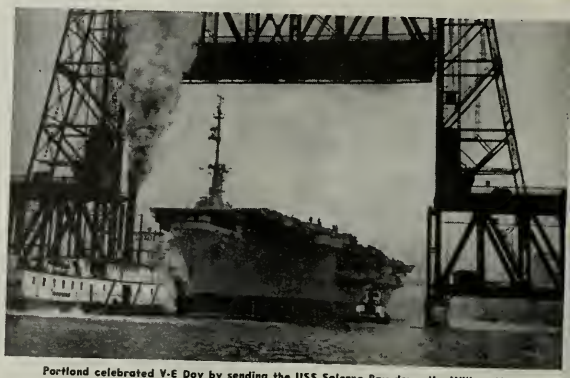


WARREN PUMPS

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NAVAL ARCHITECT WANTED

Capable of designing and estimating.
Postwar opportunity.
Write Boyce Williamson,
Chief Marine Engineer,
The Ingalls Shipbuilding Corporation,
Birmingham, Alabama



Portland celebrated V-E Day by sending the USS Salerno Bay down the Willamette.

V-E Day at Portland

YTB's and CVE's held the spotlight last month in the shipbuilding capital of the world—Portland, Oregon. The first of a series of twelve yard tugs for the Navy was launched by Commercial Iron Works, and two carriers of the CVE 105 class had their trial trips down the Willamette and Columbia Rivers, in preparation for active duty against what remains of the Axis. The first of these two ships to be readied in the Portland-Vancouver area is being completed at Willamette Iron and Steel Works, and the second, going down the rivers on May 8, turned V-E day into CVE day for the port of Portland as CIW gave it a builder's trial on the day that President Truman announced victory in Europe. By the way, this vessel is the largest ever to go through the Portland bridges, famed for their diversity of construction.

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General Agent: War Shipping Administration

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LOS ANGELES - LONG BEACH HARBORS

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General Office: 175 W. Water Street, Wilmington, California

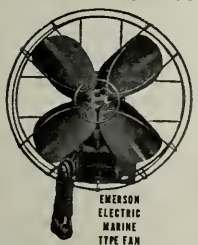


Ship's galley in Merchant Marine vessel designed for tropical service.

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ON THE SEA-LANES, air below decks must be kept "alive." Stagnant, hot-air pockets must be prevented, so our men can perform their many strenuous tasks at top efficiency. Years of service have proved that you can depend on Emerson-Electric marine fans to keep the air moving under the most adverse conditions. These fans are specially engineered for sea-duty and to resist corrosion due to salt air.

CONSIDER THESE EMERSON-ELECTRIC QUALITY FEATURES



EMERSON ELECTRIC MARINE TYPE FAN

1 Improved Parker blades with large air-moving capacity.

2 Entire fan specially treated for protection against corrosion by salt atmosphere.

3 Motor fully enclosed in pressed steel housing.

Before specifying fans, write for Emerson-Electric Marine Fan Catalog Page, No. X4945.

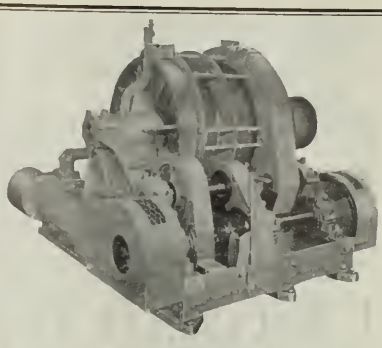
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Marine FANS

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WINDLASSES CAPSTANS
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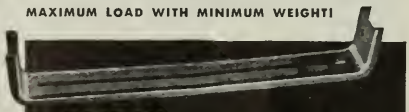
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MAXIMUM LOAD WITH MINIMUM WEIGHT!

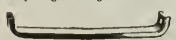


MARINCO SPREADER (HANGER)

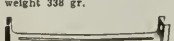
for better ship wiring installations



Spreader, Type #1 (Bar, not slotted) Maximum load 650 lbs., weight 875 gr.



Spreader, Type #2, (13 ga. single-fold solid, no holes or slots) Maximum load 250 lbs., weight 338 gr.



Marinco Spreader (14 ga. double fold slotted end to end) Maximum load 600 lbs., weight 406 gr.)

Tested with other types of spreaders by Smith-Emery Co. (Commercial Testing Laboratories), the Marinco Spreader, slotted end to end for greater ease of installation, supports 600 lb. load, yet weighs only 406 grams! Used with Marinco saddles and clamp, it forms the Universal Cable Strap, or may be ordered separately in sizes from 6" to 24". Approved (without slots) by Navy Dept., Bureau of Ships.

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SHORESIDE NEWS
In the Northwest

Commander William E. Meagher, USNR, assistant supervisor of shipbuilding in the Portland area, was recently promoted to the rank of captain. Before the war Captain Meagher was in the technical department of the Standard Oil Company of California. In the past few years he has been head of the inspection division and senior member of the sub-board of inspection and survey in the Portland area. He was the first officer to report for duty in February, 1941 in the Portland office of the supervisor of shipbuilding.

March 31st witnessed the opening of the season for the Portland Yacht Club. At the commodore's ball, Commodore Steve Vranson, succeeding Milton Henderson, shared honors with the latter at impressive flag presentation ceremonies. Other officers are: George Large, vice-commodore; Thomas J. White, secretary-treasurer; F. M. Phelps, membership chairman; Floyd Smith, treasurer, Ed Green, port chairman; Vernon Cartwright, regatta chairman; and Walter Johannsen, sailing captain.

Captain Orval Skaggs, popular boatman in local waters, died April 16th at the Barnes General Hospital. For many years active in the Oregon Outboard Association and the Portland Yacht Club, Captain Skaggs was recently in charge of the floating equipment of the Portland Army Air Base. Later he was transferred to the army air transport service. He is survived by his widow and daughter, both of Portland.

Henry A. White, executive vice president and general manager of Commercial Iron Works, and G. C. Ober, general counsel for Kaiser Co., are serving on a special ship and boat building advisory committee which is in Washington, D. C., to consider price regulations covering commercial vessels.

The huge floating drydock recently built in three sections at Kaiser-Vancouver and towed to Swan Island lifted its first vessel out of the water on April 29. At the same time, the second such dock was rapidly nearing completion at the Vancouver yard.

The Gilpin Construction Co. is to start rebuilding the 8000-ton drydock at the Port of Portland drydocks, according to John P. Doyle, manager of the port.

And from Astoria comes word that the Astoria Marine Construction Co. has just been awarded contracts by the Navy for repair work. First work will be done on two YMS's, one of which was built by the Astoria firm.

Bids Opened

Invitations to bid on the construction of three refrigerated cargo vessels have been announced by the United States Maritime Commission.

The twin-screw and turbine driven "reefers," 450 feet in length, are to be constructed for the United Fruit Steamship Corporation. Invitation to bid is extended on behalf of the steamship operator by the Maritime Commission, in accordance with provisions of the Merchant Marine Act, 1936, as amended.

Bidding is limited to American citizens and the construction must be within the continental limits of the United States. Contractors may bid on one, two or three vessels.

Bids will be received by the secretary, Maritime Commission, until 12 o'clock noon, EWT, June 18, 1945, and the commission reserves the right to disapprove, and the right is reserved on behalf of the United Fruit Steamship Corporation to reject, any and all bids.

Invitations to bid and details on the bidding may be obtained by writing U. S. Maritime Commission, Washington 25, D. C.

TECHNICAL MODEL SERVICE

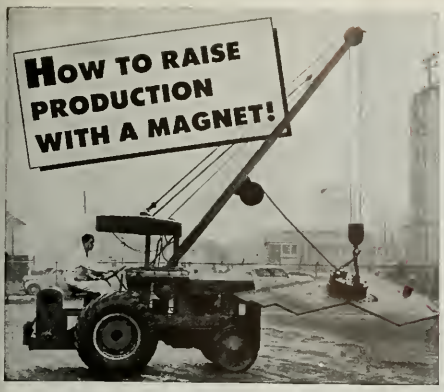
HALF MODELS . . . For the men who lay out the ship's plating.

STRUCTURAL MODELS . . . For analysis and solving problems of prefabrication.

STRUCTURAL SECTIONS . . . For visual training of personnel new to shipyard work.

LARGE SCALE MODELS . . . Fully detailed, decorated models, showing the completed ship from stem to stern, keel to topmast. A tangible record of shipyard achievement and an inspiration for all shipyard personnel.

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Put a MODEL D *Magnet-Lift* HANDI-CRANE on Your Job!

➡ Handling iron and steel scrap, pig iron and similar bulk items of magnetic material is a speedy job with the Model D Magnet-Lift HANDI-CRANE...a flip of the switch and the load is "rigged" for lifting or released; no slings, buckets or hoppers are needed.

Standard equipment includes a powerful Shrader 24-inch magnet, powered by a 1500-watt Kohler gasoline-powered generator, with cable reel, cable and controls, mounted on the standard Model D Full-Revolving HANDI-CRANE. It's a complete factory assembly, with all equipment and wiring in place, ready to go to work — nothing extra to buy. Magnet lifting capacity is approximately 300 to 350 lbs. of pig iron, heavy melting scrap, bull heads and scrap ends, or 200 to 250 lbs. of boiler plate scrap.

The speedy, compact HANDI-CRANE is easy to handle in narrow aisles, loading docks or cars; it travels anywhere, under its own power — inside the plant or in storage yards. If time means money, you'll be dollars ahead to put a HANDI-CRANE on your job now!

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BECAUSE "EVAPORATOR D-SCALER" RAPIDLY REMOVES ALL SCALE AND PREVENTS THE ACCUMULATION OF SCALE.

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BECAUSE "EVAPORATOR D-SCALER" CONTAINS ONLY A WETTING AGENT COMBINED WITH OTHER HARMLESS CHEMICALS AND DOES NOT INJURE EQUIPMENT.

SHIP OWNERS AND OPERATORS, DON'T OVERLOOK THIS NEW AND REVOLUTIONARY CHEMICAL "D-SCALER." TAKE ADVANTAGE OF ITS EFFICIENT PERFORMANCE.

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AMPLIFIED SOUND
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REMLER
Announcing & Communication Equipment
Manufacturers of Marine Communication Equipment Since 1918

Winslow Appointment

R. S. Zirbel, who is widely known throughout Pacific Coast engineering and production management circles, was recently made production manager for the Winslow Engineering Company of Oakland, California. The promotion places Zirbel on the management staff of this nationally known manufacturer of oil conditioners and filter elements.



R. S. Zirbel, Winslow Engineering Co. of Oakland, California.

Stow Opens Branch in San Francisco

The Stow Manufacturing Co. of Binghampton, N. Y., originators of the Flexible Shaft, announce the opening of a service branch at 1401 3rd Street, San Francisco. This branch will expedite the installation of flexible shaft remote valve operation gear in ships at all West Coast shipyards and docks. Complete flexible shaft assemblies ordered by the ship's engineer at sea will be available for installation immediately the ship docks.

Leon L. Allen, who will have charge of the plant, has had extensive experience in the fabrication of Stow flexible shafting. **Don S. Macaulay,** San Francisco regional representative, and **Ted R. Henry,** Los Angeles regional representative, will furnish engineering and designing service to architects, ship's engineers, machinists and outfitters. Their experience will contribute to the study of any special adaptation of flexible shafting for power drives or remote control.

For the convenience of western industries an adequate stock of flexible shaft portable machines will be maintained.

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THE MERCHANT OFFICERS PROTECTIVE SYNDICATE

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THE UNIVERSAL TIN SAVING BABBITT METAL

Bondrat is superior to the highest grade tin babbitts in most respects, is the equivalent to them in all others YET COSTS APPROXIMATELY 40% less.

Full replacement for highest grade tin babbitts for use in bearings on all types of machinery, locomotives, street cars, Diesel engines, motor trucks, automobiles, marine engines, farm and mining machinery. Recommended for all pressures and high speed work also in place of lower grade babbitts as it will outlast them from 4 to 6 times, thus saving many rebabbittings as well as time and money.

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3877 Santa Fe Avenue, Los Angeles, Calif.
Tel. Kimball 8211



Raymond P. Lansing elected a director of Bendix Aviation Corporation.

Bendix Expands

The Bendix Radio division of Bendix Aviation Corporation has expanded its West Coast quarters at North Hollywood, California, to provide complete shop facilities for assembly and production of special equipment, mock-ups and experimental radio installations for aircraft, railroad, marine and other applications. R. B. Moon is Pacific Coast manager for the division, which has its headquarters in Baltimore. A complete line of Bendix Radio equipment and spare parts is stocked.

Trained personnel is available for servicing and overhauling radio communications and navigation equipment. The staff of Bendix Radio's western branch includes four field engineers, together with mechanical engineers, draftsmen, machinists, sheet metal workers, and assembly workers.

Western Electric Changes

Will Whitmore, advertising supervisor of the Western Electric Company, has been named advertising manager to succeed H. W. Forster, deceased, according to a recent company announcement. Mr. Whitmore joined the Western Electric Company in 1929 and his articles, especially in the field of popular science, have appeared widely in business, trade and photographic magazines.

General Alloys Appoints Representative

Herbert King, of King and Anderson, has been appointed field representative for the General Alloys Company for the State of California with offices in San Francisco, Los Angeles, Seattle, and Portland.

Mr. King, for nine years vice president in charge of sales for the National Battery Company and its subsidiaries, organized and successfully operated the first hard rubber company on the West Coast. He is now representative for Negler Manufacturing Co., Diamond Metal Products Co., and Gould Batteries.

New Vice President

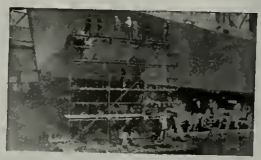
The election of H. G. Schad as vice president of The Atlantic Refining Company was announced May 4. He is director and general manager of transportation of the company.

Mr. Schad joined Atlantic as assistant to the general manager of transportation in 1925, and was made general manager in October, 1941.

GENERAL SHIP SERVICE COMPANY



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Tank and Boiler Cleaning
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Pacific MARINE REVIEW

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Pacific Marine Review

OFFICIAL ORGAN
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Shipowners Association
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J. S. HINES
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MEMBER AUDIT BUREAU OF CIRCULATIONS

Subscription rates:

One year, $1.50; two years, $2.50; three years, $3.00; foreign, $1.00 additional per year; single copies, 25c.

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PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
Offices in: NEW YORK CITY . . . . . 16 West 46th Street, Telephone BRyant 9-8436
LOS ANGELES . . . . . 816 West 5th Street, 13. Telephone MIchigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.



Miles of MANILA ROPE must serve every battleship

OFFICIAL U. S. NAVY PHOTO

Among the innumerable tasks in which rope serves best, on shipboard, is towing . . . nothing has ever been fabricated that equals Manila Rope for this service. It has great strength, elasticity, and handles fast. The deck crew, in the photograph above, is undergoing a Navy training course in handling rope.

Rope, a sinew of war, is fast being expended in the war areas, and the demand for it increases as the war against Japan is stepped up. After complete victory, Columbian Rope will again be available to everyone.



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COLUMBIAN *Rope*



THROUGH THE GOLDEN GATEWAY—TOMORROW-BOUNDI

Shipping and The San Francisco Charter

In the Preamble of the San Francisco Charter there are commitments of vital interest to international shipping. It runs, "We . . . to promote social progress and better standards of life in larger freedom . . . have resolved to combine our efforts to employ international machinery for the promotion of the economic and social advancement of all peoples."

Taken with "faith in fundamental human rights" this would certainly tend toward a great growth in international trade and shipping. These words bring a challenge to shipping. As we read history, much of the strife of past centuries has been over international shipping problems. International shipping of the post-war period can be one of the most effective agencies for promoting or killing these high purposes of the charter.

In the immediate post-war period, we will have a fleet of merchant vessels larger by far than ever existed under one flag. This places on us a great responsibility to use this fleet for promoting the purposes of this charter, which bears the name of one of our own great ports, and in which we have so large a stake for future security and prosperity.

The whole-hearted approval of the San Francisco Charter may logically result in a continuation of control of international merchant shipping under the direction of the Economic and Social Council.

Practically every present maritime nation is signatory to the Charter, and also to the present co-ordinated control of shipping which is to extend for a six months period after V-J day.

Certainly a properly administered world-wide control of shipping would be a great improvement over the chaotic periods in shipping affairs that have characterized many past decades.

The tremendous possibilities that can result from a stabilization of long time international credits—possibilities for uplift in living standards, for increase in productive effort, for interest in world travel—all point to cargoes in great volume and to profitable employment for ships.

Ships constitute a very important part of that international machinery which is to be employed for "the economic and social advancement of all peoples."



Vice Admiral Emory S. Land, U.S.N. (ret.)

COORDINATED CONTROL OF ALLIED MERCHANT SHIPPING

ABOUT THE MIDDLE of May all Allied merchant shipping came under the control of the United Maritime Authority, which had been established for that purpose some months previously. This is pursuant to an agreement signed by the principal Allied merchant shipping powers which pledges each of them to make all seagoing vessels available for the Allied Pool during a period lasting for six months after V-J Day, or until terminated by unanimous consent prior to that date.

The announcement of this control came from Washington and London simultaneously, and has the effect of tightening the controls on merchant shipping, since the Anglo-American Combined Shipping Adjustment Board is retained in the U.M.A. and that board still has first call on all shipping.

Sweden has joined the pool, which makes all of her highly efficient fleet of vessels subject to C.S.A.B., along with the fleets of the other ten Allied signers. These include United States, Great Britain, Norway, Netherlands, France, Belgium, Greece, Poland, India and Australia.

U.M.A. controls through a council and a board of elected representatives, known as United Maritime Executive Board, who have absolute allocation authority over all ships left in the pool after the requirements of C.S.A.B. have been met.

The fact that this new control has been placed over shipping heralds completion of the victory in Europe. All mines in the Skaggerack and other constricted sea channels have been cleared and all stray German submarines eliminated.

U.M.E.B. is operated in two branches, one sitting in Washington, the other in London. These branches each have important committees.

Five nations—United States, United Kingdom, Norway, The Netherlands and France — each have full membership in U.M.E.B. The other countries tied up in this agreement are associate members.

At the meeting of the Washington Branch in May the member representatives were: United States, Admiral Land and Captain Granville Conway; United Kingdom, W. O. Hart and E. M. Nicholson; Norway, Christian Blom; The Netherlands, J. F. Van Hengel; France, Paul Blandin; Poland, W. Talmont; India, A. C. B. Synon; Greece, Manuel E. Kulukundis; Canada, A. L. Lawes; Belgium, Fred Good; New Zealand, N. W. Marshall; and Australia, W. E. Lee.

The committees of the Washington Branch U.M.E.B. and their chairmen are: Ship Employment Policy, Captain Conway; Traffic Control, F. M. Darr, WSA director of traffic; Allocations, Dudley B. Donold, WSA director of allocations; Tanker Allocations, J. J. Winterbottom, WSA director of tanker allocations; Freight Rate, John M. McArt, WSA director of freight rates; and Shipping Facilities Control, John W. Mann, WSA director of foreign charters and ship warrants.

The secretariat for the Washington Branch is headed by John P. Davis, assistant deputy administrator for fiscal affairs, WSA. As legal advisor to the branch they chose William Radner, WSA General counsel.

We do not have the line-up on the London Branch of U.M.E.B., but since C.S.A.B. is a joint board elected by WSA and the British Ministry of Transportation we may assume that B.M.S. dominates in the London Branch just as WSA does in the Washington branch, and rightly so, since war is and for some time will be the principal business of merchant shipping.

S.S. Europa



Subsequent to the May meeting of the Washington Branch, Admiral Land issued the following statement:

"The United Maritime Authority, established by international agreement last summer to provide for continued control of merchant shipping, was officially brought into operation.

"Under the terms of this agreement, the governments involved accepted as a common responsibility the provision of shipping for military and other tasks necessary for and arising out of the completion of the war in Europe and the Far East and for the supplying of the liberated areas as well as the United Nations generally and territories under their authority. Unless sooner terminated by the agreement of the governments, the United Maritime Authority will remain in effect for six months after the termination of the war in the Far East.

"Following a meeting this morning of the Washington Branch of the United Maritime Executive Board, and a similar meeting held in London, the War Shipping Administration and the British Ministry of War Transport issued the following statement:

" 'The governments of the United States and United Kingdom, acting in consultation with the other contracting governments concerned, have determined that the "central authority established pursuant to the agreement on principles having reference to the continuance of coordinated control of merchant shipping" entered into in London, August 5, 1944, shall come into operation this, the 24th day of May, 1945. This action is taken pursuant to Article 14 of the annex to the aforesaid agreement on principles.' "

Agreement on Principles

The "agreement on principles having reference to the continuance of coordinated control of merchant shipping" sets forth nine principles concerning such control, which may be briefly stated as follows:

(1) A common responsibility to supply shipping for the completion of the war in Europe and the Far East, and for supplying all the liberated areas.

(2) A common control over all ships for their use as in (1), to be exercised by each government by requisition or use or title.

(3) A common consent to release ships from this control only on a mutually acceptable formula.

(4) Neutral governments to be invited to join this control.

(5) National control over shipping facilities on the lines of United States and British ship warrant plans.

(6) United Nations requirements to determine use of ships.

(7) Establishes central authority and its powers and duties.

(8) Principles agreed on to apply to all types of merchant ships.

(9) Principles to take effect when central authority is established and to remain in effect for six months after suspension of hostilities.

This agreement was "done in Lon-



A locomotive being swung to the deck of a Victory ship headed from a West Coast port to the accelerated mop-up in the Pacific.

(War Shipping Administration photo)

This striking silhouette off Iwo Jima shows merchant ships side by side with fighting sisters of Navy and Coast Guard, shuttling troops and supplies to the embattled beachhead. *(War Shipping Administration photo)*





A transport built by the Maritime Commission for invasion service comes to rest at a Philippines crossroad.
(War Shipping Administration photo)

don on the 5th day of August, 1944." An "annex" to the agreement setting up the organization of the United Maritime Authority reads as follows:

Organization of United Authority

(1) The United authority shall consist of—



A West Coast port, with cargo ships taking on fighting planes and other war supplies for our Pacific forces.
(War Shipping Administration photo)

(a) A Council (United Maritime Council).

(b) An Executive Board (United Maritime Executive Board).

The United Maritime Council

(2) Each contracting government shall be represented on the council. Membership of the council shall also be open to all other governments, whether of the United Nations or of neutral countries, which desire to accede and are prepared to accept the obligations of contracting governments.

(3) The council shall meet when deemed necessary and at least twice a year at such places as may be convenient. Meetings shall be arranged by the executive board. The council shall elect its own chairman and determine its own procedure. The meetings of the council are intended to provide the opportunity for informing the contracting governments as to the over-all shipping situation and to make possible the interchange of views between the contracting governments on general questions of policy arising out of the working of the executive board.

The United Maritime Executive Board

(4) The Executive Board shall be established with branches in Washington and London under War Shipping Administration and Ministry of War Transport chairmanship, respectively.

(5) The Executive Board shall exercise through its branches the executive functions of the central authority. Appropriate machinery under the two branches shall be established for the purpose of enabling them to discharge the functions described to paragraph 7 of the Agreement on Principles. Machinery to carry out the arrangements under paragraph 8 of that Agreement as regards ships engaged in coasting and short sea trades, and as regards small craft, shall be set up under the Executive Board.

(6) The division of day-to-day responsibility between the two branches of the Executive Board shall be established as convenient from time to time. So that the two branches of the Executive Board may work in unison, meetings of the Executive Board as a whole shall be

arranged at the instance of the two chairmen, as often as may be necessary, and at such place as may be convenient from time to time.

(7) The membership of the Executive Board shall be restricted in numbers. By reason of their large experience in shipping normally engaged in international trade, and their large contribution of ships for the common purpose, the following governments shall be represented on the Executive Board:

Government of the United Kingdom of Great Britain and Northern Ireland;

Government of the United States of America;

Government of The Netherlands;

Government of Norway.

It shall be open to the members of the Executive Board to recommend to contracting governments additions to the membership of the Executive Board as circumstances may require in order to promote the effective working of the central authority.

(ED.—France was added later.)

(8) Each contracting government not represented on the Executive Board shall be represented by an associate member who shall be consulted by, and entitled to attend meetings of, the Executive Board or its branches on matters affecting ships under the authority of that government, or on matters affecting the supply of ships for the territories under the authority of that government.

(9) The Executive Board and its branches shall proceed by agreement among the members. There shall be no voting.

(10) The decisions of the Executive Board affecting the ships under the authority of any contracting government shall be reached with the consent of that government, acting through its representative on the Executive Board or through its associate member, as the case may be.

(11) The Executive Board shall be the duly authorized body for the purpose of paragraph 9 of the Agreement on Principles, but it is understood that no decision reached under that paragraph by the governments represented on the Executive Board shall impose any new or greater obligation on any other contracting governments without its express consent.



A Victory ship.
(U. S. Maritime Commission photo)

(12) A Planning Committee shall be set up to begin work in London as soon as possible after the signature of the Agreement on Principles for the purpose of working out on a basis satisfactory to the contracting governments the details of the machinery required to enable the Executive Board to discharge its functions, including the functions under paragraph 7 (f). Any contracting government may be represented on the Planning Committee.

(13) The Executive Board shall have the full use of the machinery and procedure of the War Shipping Administration and Ministry of War Transport in order to avoid duplication.

(14) The contracting governments shall nominate their representatives on the Planning Committee to the governments of the United States and the United Kingdom, as soon as practicable. They shall also so nominate their representatives as members or as associate members of the Executive Board as the case may be. The governments of the United States and the United Kingdom shall be responsible, in consultation with the other contracting governments concerned, for determining the date of coming into operation of the central authority in accordance with paragraph 7 (a) of the Agreement on Principles.



Liberty ships dropping their war cargoes at a Mediterranean port.
(War Shipping Administration photo)



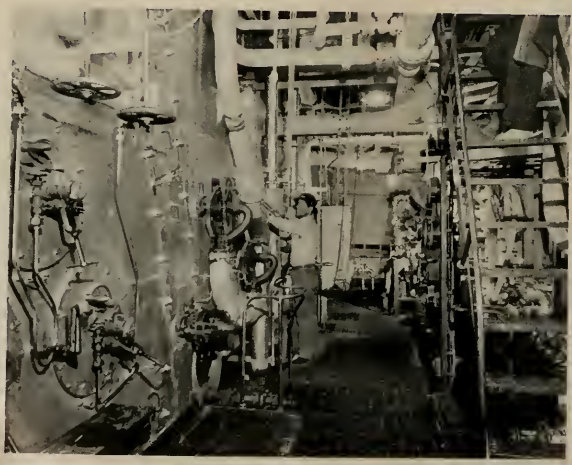
Turbo-electric tanker Palomo Hills in San Francisco Bay off Marinship yard.
(All photos courtesy Marinship)

Turbo-Electric Machinery

for Hills Class Tankers

MARINSHIP, the shipyard near Sausalito on San Francisco Bay, has become world famous as a builder of tankers. This firm is nearing completion on its Maritime Commission contracts and is being converted to a marine repair plant. Recently we secured, through the courtesy of this firm, the very fine set of tanker machinery pictures that illustrate this article.

All of the tankers built at this yard are the Maritime Commission T2 - SE type, which means tanker design No. 2 with single screw and electric drive. These tankers as built at Marinship were in two divisions, the A2 or Mission class, and the A1 or Hills class. The only difference in the specifications is the horsepower of the main propulsion ma-



Boiler room, featuring firing front of steam generator at left and combustion control at right.

chinery, which is 10,000 shp maximum for the Mission class and 8250 shp maximum for the Hills class.

The hull design and main features were described in a **Pacific Marine Review** article covering the Mission class tankers of this series, and the present article is to describe and illustrate the machinery of the Hills class. Principal dimensions of these hulls are: length O.A., 523½ feet; beam, 68 feet; draft loaded, 30 feet; net measurement, 6107 tons; deadweight capacity, 16,765 tons; fuel oil cargo capacity, 138,000 bbls.; normal propulsion power, 6600 shp; and cruising radius, 12,600 nautical miles.

Propulsion machinery as installed on the Hills class tankers built at Marinship comprises a boiler plant generating steam for a turbo generating plant, which delivers electrical power to a large electric motor directly connected to a screw propeller through a steel shaft.

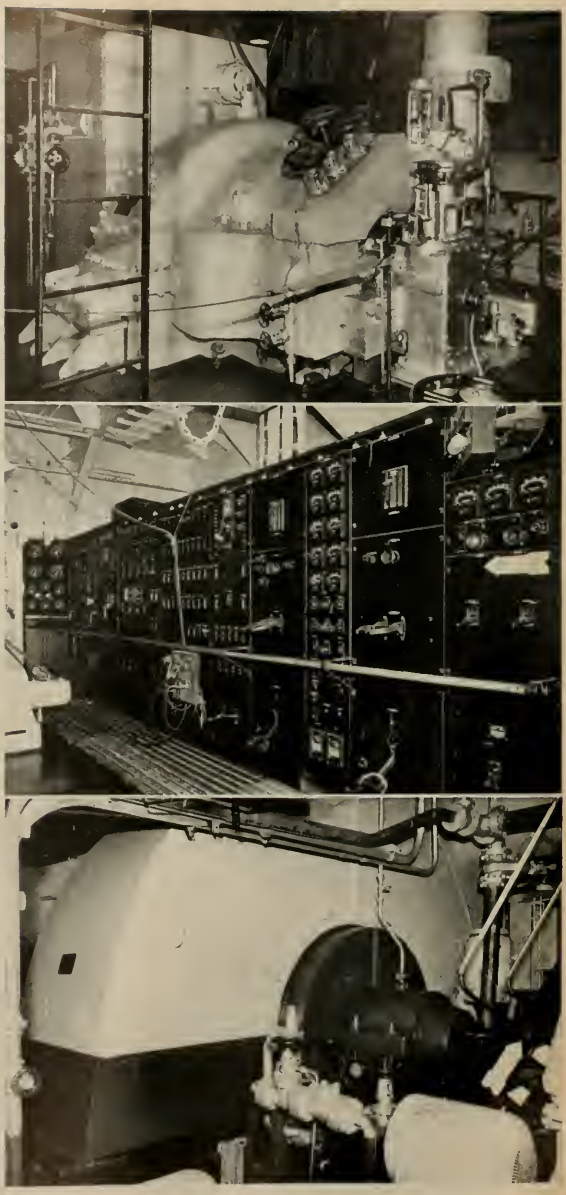
The steam generating plant consists of two Combustion Engineering boilers operating: 459 psi at drum; 450 psi and 730° F. total temperature at superheater outlet; with a normal evaporation rate of 32,056 p.h.; and an overload capacity for 44,436 p.h.

This steam arrives at the Elliott turbine throttle with 720° F. total temperature and 435 psi gage pressure and exhausts from the turbine into a Graham condenser at 28.5" vacuum. Thence the condensate is pumped through feed water heaters and Ingersoll-Rand pumps back to the boiler to repeat its cycle.

Directly connected to this turbine is an Elliott generator. At the normal speed of 3715 rpm the output in electrical energy is 5400 kw alternating current three phase 4000/2300 volts 780/1350 amperes.

Application of this electric energy to an Elliott propulsion motor produces 6600 shp on the propeller shaft at 93 rpm.

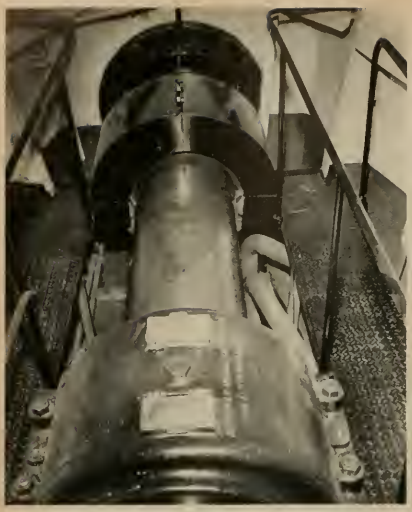
Two Elliott 400-kw steam turbine driven generating sets are in-



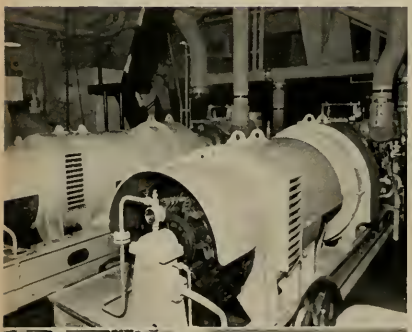
Top of page: Main turbo generating set.

Center: Main switchboard.

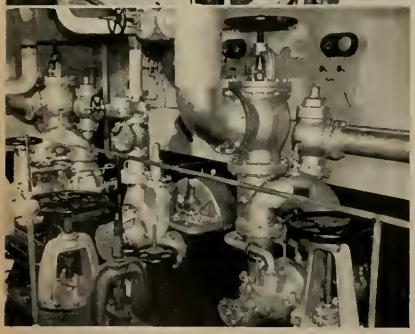
Bottom: Main propulsion motor on tanker



Propeller drive shaft.



Two auxiliary turbo generating sets.



Two of the main fuel oil cargo pumps and one rotary stripper pump.

stalled to take care of all auxiliary requirements. These turbines operate under the same steam conditions as do the main propulsion turbines, and the steam exhausts into a separate Graham condenser, and from thence goes into the same cycle of feed water heaters and feed pumps as the main turbine steam.

The principal auxiliary load on any tanker is the pumping of cargo. On the Hills class T2 tankers the main cargo pumping load is taken by three 2 stage Ingersoll-Rand centrifugal pumps driven by Westinghouse electric motors. Each of these pumps has a capacity to discharge 2000 gpm against 100 psi. For stripping, two electric motor drive rotary type Ingersoll - Rand pumps are installed, each with a capacity for 400 gpm at 100 psi discharge pressure. There is also a standby steam drive Worthington reciprocating stripper 14" x 14" x 12".

The two main feed pumps are Ingersoll - Rand centrifugals driven by Elliott steam turbines. Each of these pumps has a capacity for 200 gpm at 575 psi discharge pressure.

Steering gear is of the hydro-electric double ram Rampson slide type with duplicate differential hydraulic pumps each driven by a 30-hp Westinghouse motor. This gear was built by Stetson-Ross.

The windlass is a product of Hesse-Ersted and is a steam drive double wildcat machine with capacity to lift two 11,400-lb. anchors at 33 feet a minute. This firm also supplied two steam drive cargo winches each having capacity to lift 9200 lbs. at 190 ft. per minute.

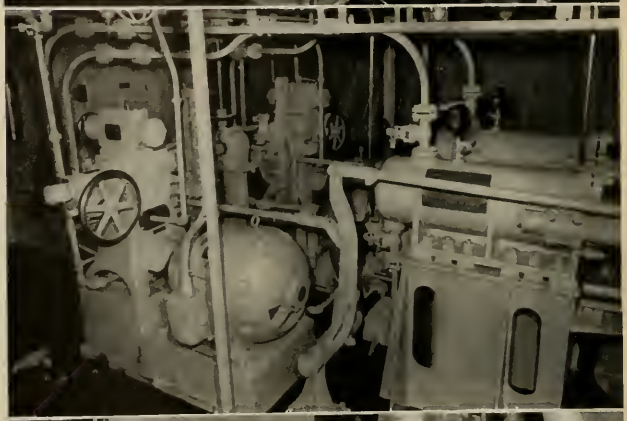
An American Engineering steam driven warping winch capable of exerting a rope pull of 17,500 pounds is included in the deck machinery.

Electric motor drive general service pumps include: one fire and Butterworth cleaning system; one fire and general service; two Quimby fuel oil service; two Quimby lube oil pumps; two La Boin bilge; and one Quimby fuel oil transfer. Steam drive standby pumps are one 14" x 14" x 12" fuel oil transfer, and one 10" x 7" x 10" fire and ballast, both Worthington.

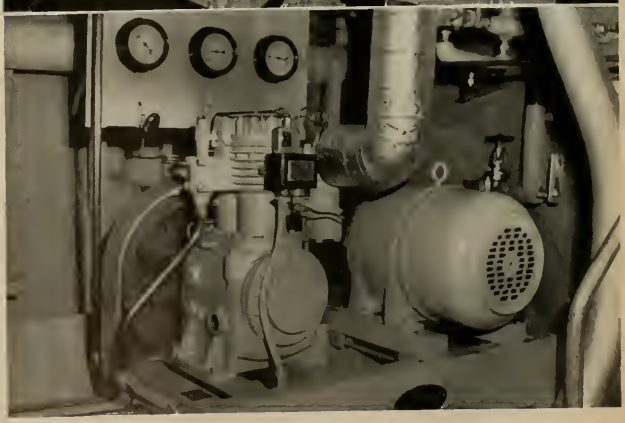
The machinery of these tankers has functioned satisfactorily even during the hectic war service in which they are all at present engaged.



A partian of wheel house, featuring Gyro Compass Repeater and Automatic Helmsmon.



Steering gear, showing pumps and hydraulic rams.



Refrigerating unit.



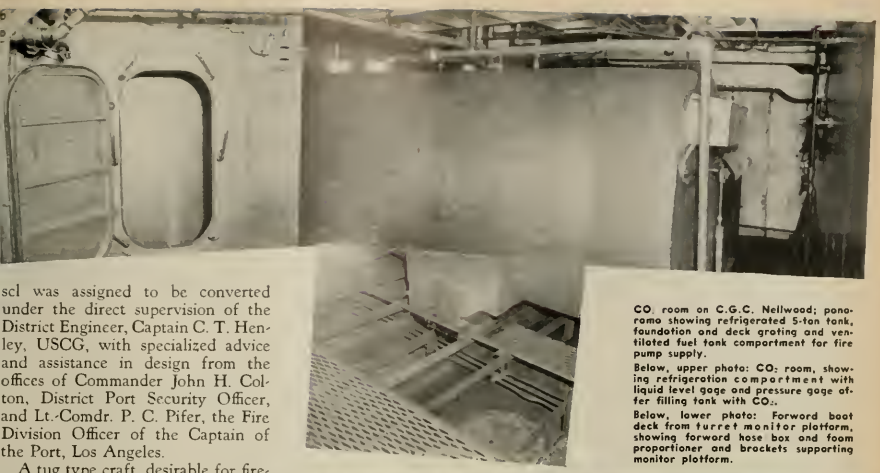
Coast Guard Fire Fighting Cutter

(All Photos Official U. S. Coast Guard Photos)



AN INTERESTING new development in fireboat design is incorporated in the recent conversion of a vessel by the U. S. Coast Guard for the fire fighting service maintained in major ports by that organization.

As a function of the Port Security program assigned to the Coast Guard pursuant to Presidential Executive Order No. 9074 of February, 1942, the Coast Guard has developed a comprehensive program of fireboats, fire fighting trailer pumps, and specially trained fire fighting personnel to supplement the municipal facilities of major ports and harbors during the war emergency. The prevalence of petroleum products and other highly flammable cargo in certain ports and the apparent effectiveness of using carbon dioxide (CO_2) in controlling fires in flammable liquids resulted in a recommendation from the Coast Guard, Eleventh Naval District that a new type fireboat be added to the service in the Los Angeles-Long Beach port, such boat to include the feature of newly developed CO_2 fire fighting facilities. This recommendation was approved by Coast Guard Headquarters and a ves-



CO_2 room on C.G.C. Nellwood; panorama showing refrigerated 5-ton tank, foundation and deck grating and ventilated fuel tank compartment for fire pump supply.

Below, upper photo: CO_2 room, showing refrigeration compartment with liquid level gage and pressure gage after filling tank with CO_2.

Below, lower photo: Forward boat deck from turret monitor platform, showing forward hose box and foam proportioner and brackets supporting monitor platform.

scl was assigned to be converted under the direct supervision of the District Engineer, Captain C. T. Henley, USCG, with specialized advice and assistance in design from the offices of Commander John H. Colton, District Port Security Officer, and Lt.-Comdr. P. C. Pifer, the Fire Division Officer of the Captain of the Port, Los Angeles.

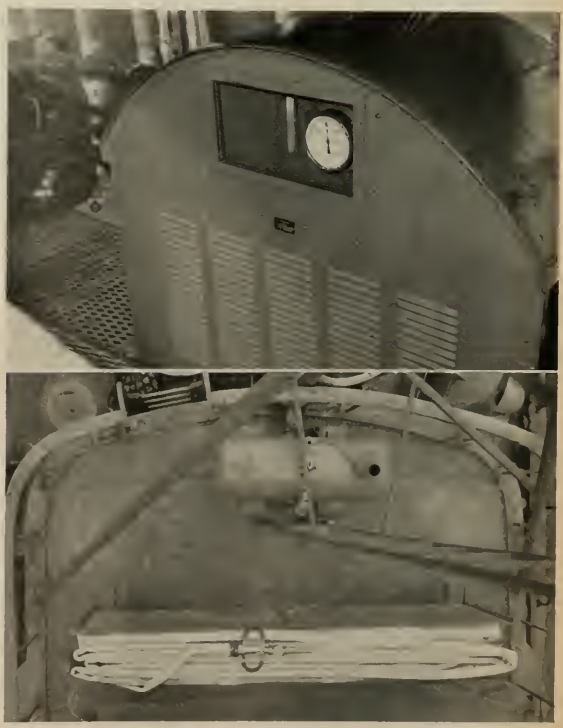
A tug type craft, desirable for fireboat service, was not available but the Nellwood, a former yacht converted to the needs of the Coast Guard patrol service, was withdrawn from patrol and assigned to the conversion. This vessel has an overall length of 126 feet 1 inch, a beam of 22 feet 6 inches, and a depth of 11 feet and was originally powered with two 4 cycle, 6 cylinder, 10 inch bore, 14 inch stroke Winton Diesels, giving the craft a rated speed of 13 knots. Draft, fully loaded, is 6 feet 4½ inches forward and 9 feet ½ inch aft. She has a stout steel hull and was built by Pusey and Jones, Wilmington, Del. in 1929.

Hull conversion and machinery installation was done by the Craig Shipbuilding yard at Long Beach. The interior of the hull was practically rebuilt. The CO_2 system, manufactured by the Cardox Corporation, Chicago, was installed under the supervision of Cardox Western Inc., Los Angeles, California.

The Nellwood is equipped with three fire fighting control systems: water, foam, and CO_2.

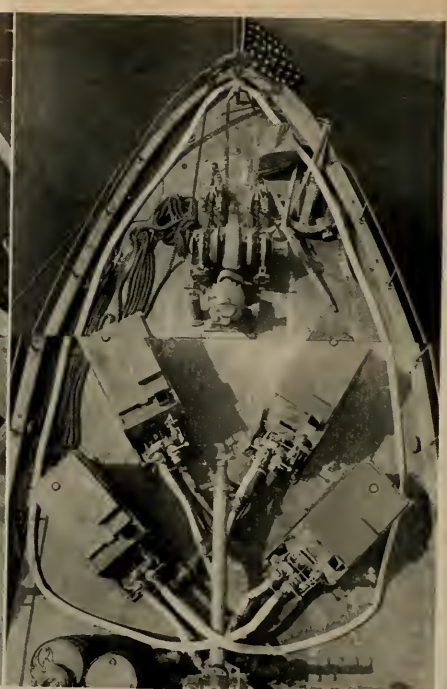
Water System

The water system consists of two groups of Hale-Chrysler gasoline engine drive, skid unit fire pumps—one group forward and one aft with four pumps in each. Rated combined pumping capacity is 4000 gpm at 120 psi. Piping is so arranged that this quantity of water can be directed through four standard monitor noz-





Aft group of skid units, showing suction and discharge connections.



Forword main deck, showing bow group of skid units and portable monitors.

zles, and 16 hand hose outlets. There are two hand hose manifolds each of which has eight outlets and is under the control of a Clayton Regulator valve which is adjustable to maintain any desired set pressure. Pumps deliver their full rated capacity at 120 lbs. but can pump over their capacity at 200 lbs. Nozzle pressures desirable for monitor streams are 100 lbs. whereas 45 lbs. is desirable for hand hose lines due to the factor of safety required in handling of hose lines by fire fighters. The Clayton valves make it possible to furnish required nozzle pressures simultaneously to monitors and hand hose lines from the same pump supply. Two of the monitor nozzles are of the fixed standard type and two of the portable type. Each monitor has nozzle tips up to a 2 inch size with 1200 gpm capacity. Two specially designed hose boxes, one forward and one aft, have a combined capacity of 2400 feet of 2½ inch fire hose and 800 feet of 1½ inch hose and are designed so that the hose may be laid out directly from either side of the vessel. Morse valves of the ball type control each hose outlet permitting instant shut-off with one quick quarter turn.

Included in the very complete fire fighting equipment are special cellar type nozzles for under-pier fires, straight-stream nozzles for direct streams on fires, and the Navy special fog or vapor type nozzles which atomize the water into finely divided particles for increased heat absorption and improved efficiency in the quenching action of the water.

Foam System

Foam for smothering fire is provided by an Aer-o-foam system with two 50 gallon proportioners — one forward and one aft. Each of these proportioners when supplied with water, from the water manifold nearest to it, will produce a continuous stream of foam at the rate of 600 gpm.

CO_2 System

The Cardox installation on the Nellwood is designed to give adequate low-pressure carbon dioxide for the quick smothering of fires through direct application using hose reels, and also for flooding enclosed areas such as the holds of a ship, giving effective extinguishment without damage from the extinguishing agent.

Low-pressure carbon dioxide is stored in an insulated tank, and the temperature in the tank is maintained through refrigeration at approximately 0° Fahrenheit with a corresponding pressure in the tank of around 300 lbs. per square inch. At this temperature and pressure the liquid carbon dioxide is capable of absorbing approximately 150 British thermal units per pound when it is converted into a vapor at 70° Fahrenheit. Upon discharge the liquid carbon dioxide is instantly converted into carbon dioxide snow and vapor at a temperature of 110° Fahrenheit

below zero, which reduced temperature is caused by self-refrigeration of the carbon dioxide in changing from a liquid into vapor. In such a discharge of liquid carbon dioxide at 300 lbs. pressure, 45% of the liquid by weight becomes snow and 55% vapor. The fact that low-pressure carbon dioxide forms a high percentage of snow upon discharge makes possible the projection of the discharge for a considerable distance.

The installation on the Nellwood includes four 150 foot 1½ inch CO_2 hose lines on reels, each line capable of discharging at a rate of 750 lbs. per minute, making a total of 3000 lbs. per minute possible discharge for all hose reels operating simultaneously. Two of the reels are equipped with high-velocity nozzles designed especially for direct application, and two are equipped with low-velocity nozzles which also can be used for direct applications, but being smaller than the high-velocity type can be readily inserted through the port holes of ships if it is desired to flood the holds with carbon dioxide. Pressure is maintained at the individual hose reel locations at all times so that it is merely necessary to open the valve at each hose reel to obtain discharge.

Cardox pressure vessels are manufactured for a working pressure of 325 lbs. per square inch and are tested in accordance with the A.S.M.E. requirements for unfired pressure vessels. The tankage installed on U.S.S. Nellwood has a capacity for 5 tons. It is estimated that 5 tons of CO_2 will produce a 30% concentration in a space of 250,000 cubic feet. The largest machinery space aboard ship in which a general fire condition may be found will be approximately 200,000 cubic feet. The largest individual cargo spaces aboard ship are approximately 120,000 cubic feet although larger individual spaces may be found in occasional lumber-carrying vessels and in the larger passenger vessels. Five tons of CO_2 capacity should be sufficient for all fires involving single vessel spaces with reserve to handle fires or exposure conditions in spaces adjacent to those which are directly involved in the fire.

The system is designed to maintain normal tank pressure with an ambient temperature of 100° Fahrenheit with 60% running time of the refrigerator. Adequate relief valves are installed on the tank in such a way that it is impossible for the tank to be left without this protection. In addition to the relief valves, a frangible disc is also installed in such a way that in the event excessive pressure builds up to 600 lbs. — which might occur if the refrigerator were out of commission for a long period of time — the pressure in the tank would be relieved to the atmosphere outside the ship.

Liquid fill lines and vapor equalizing lines which are used to connect with the Cardox delivery track for the purpose of filling the tank on the Nellwood are terminated above the deck at a central location so that filling of the carbon dioxide storage tank can be accomplished readily from either side of the ship. All piping, including the fill lines and the header, are welded so as to eliminate any possibility of leaks developing in this piping. The tank is insulated in such a way as to reduce input of heat from the atmosphere to an absolute minimum; thus, also limiting the amount of refrigeration required to control the temperature and pressure inside the tank. The refrigerator is contained in a steel housing having an instrument panel under glass to show the liquid level and tank pressure at all times. This refrigerator is arranged to operate from 125V D.C. which is the type of current available on the Nellwood.

U.S.S. Nellwood carries a crew of 36 officers and men. Seventeen of the 36 are specialist firefighters and some have had as much as 10 years experience in municipal work. They are equipped with every type of firefighting equipment, including clothing (heavy duck and also asbestos suits), special nozzles and self-contained breathing masks.



Forward monitor turret, showing piping and hose manifold, foam proportioner and hose box.

The skipper of the Nellwood is Lt. (jg) B. L. Lupher, who until recently commanded a LST in the Pacific.

Testing operations of CO_2 nozzle. Note frost on nozzle just tested.



Loading







UNCLE SAM'S NAVY through various commissions has many times recommended the establishment of a Naval Supply Base on San Francisco Bay. These recommendations, running back to World War I, had fallen on deaf ears until 1939, when the first appropriation was passed to authorize construction.

In hearings before the Senate Committee on Naval Affairs, Rear Admiral (then Captain) Arthur H. Mayo, SC USN, representing the Bureau of Supplies and Accounts, carried through to its authorization the bill which was to provide $6,500,000.00 (covering 800,000 square feet storage space).

As outlined in his testimony before the Senate Committee, the essentials for a supply depot consisted of: "first, proximity to the fleet anchorage; second, accessibility to the railroad terminals; third, accessibility to markets and sources of supply; fourth, accessibility to shipping and berthing piers; fifth, accessibility for the mobilization and loading of merchant vessels taken over by the Navy for war purposes." He testified further that: "In planning our peacetime development we must naturally take into consideration the fact that it must be so placed as to be available to **give the best kind of service to the Navy if an emergency ever occurs.**"

The site known as the Oakland (Calif.) Middle Harbor was chosen as best qualified to meet all of these conditions. Much of this site was composed of tidal mud flats. It lies between the Southern Pacific Mole and the Western Pacific Mole and is served at its landward side by the Santa Fe. Thus it is directly in touch with three great transcontinental railway systems.

Dredging started in January, 1940, and the first piles were driven in August, 1940, for Building 313. A separate command, the Advanced Base Depot, was the first building

Top: General view of warehouses.

Center: Large warehouse viewed across berthing basin.
(Official U. S. Navy Photograph)

Bottom: View along one of the transit shed piers featuring half gantry crane.
(Official U. S. Navy Photograph)

to be completed in May, 1941, and it was followed during the next six months by eleven additional warehouses, one of them a six-story building of 432,000 gross square footage. At the time of the Depot's official commissioning, December 15, 1941, but three berths for ships were in operation, and most of its stores were yet to be received. The first ship to be loaded at the Depot was the USS Aldebaran, which pulled out into the stream on March 7, 1942.

The provision of efficient logistic material support for the Fleet, advanced bases, and stations in the Pacific Ocean area, and of allowance list material for new ships in the San Francisco Bay area, is the mission of this Naval Supply Depot. As a link between the production line and the firing line, N.S.D. receives, stores, and ships to the far-flung theaters of naval operations in the Pacific hundreds of thousand of tons of supplies of every description. Under the command of Rear Admiral Mayo its force of 9626 civilians, 3544 enlisted men and WAVES, and 496 officers are working day and night in order that the battle of the supply line, of which Oakland is such an important part, will be victorious—for on the success or failure of that battle will depend the ultimate victory in the Pacific.

Today N.S.D. Oakland occupies an area of approximately 500 acres. 6,421,283 gross square feet of covered storage and 461,320 gross square feet of transit shed space and about 3,045,320 square feet of open storage are used to store practically every type of material required for the Navy's use—34,000 different items of general stores being carried in stock, and 220,000 different items of aeronautical material and parts as well as 2000 items of provisions and ships' store stock. There are 104 buildings on the site, 56 of which are storage or transit, 3 manufacturing, 19 for common services, and 26 for barracks and quarters.

Two of the newest and finest piers on the West Coast, together with new marginal wharf construction, have berthing facilities for 13 ocean-going ships, and are capable of servicing every type of vessel utilized by the Navy. Thirty-two miles of railroad tracks provide a network of rail facilities for the storehouse and waterfront areas. In addition, outlying activities of the Depot are located in the cities of San Francisco and Oakland, and at Point Molate, Richmond, California.

N.S.A. Stockton

At the present time there is under construction on Rough and Ready Island near Stockton, California, the Naval Supply Annex, Stockton—a permanent installation to be operated as an Annex to NSD, Oakland. This new activity will cover over 1400 acres and will include a Holding and Reconsignment Point, a Material Redistribution Center, as well as 42 standard storehouses for general stores, radio supplies, provisions and aeronautical material. Ocean-going vessels will be able to berth at the 7800 feet of marginal wharf being constructed at this new Annex. Like the Naval Supply Depot, Oakland, the Naval Supply Annex, Stockton, is served by the Southern Pacific, the Western Pacific, and the Santa Fe railroads.

Organization

N.S.D. is divided for organizational purposes into many branches. Included are: General Supply Branch, which stores, issues and ships the 34,000 items of general stores directly to

Close-up of half gantry lifting heavy unit aboard.
(Official U. S. Navy Photograph)





Large tires on pallet.



Drums of petroleum products on pallet.
(Official U. S. Navy Photograph)

the fleet or to other branches or sections; Aviation Supply Annex, which stocks 220,000 items and furnishes over 80 per cent of all the aeronautical supplies for the Navy in the Pacific theater; Provisions and Ships Stores Stock Branch, whose shipments during the past year included 152 million pounds of meat, 12 million pounds of butter, 9.5 million dozen eggs, 35 hundred tons of ice cream powder, and 240,000,000 candy bars; Coffee Roasting Plant, which roasts 5000 pounds of coffee each hour of every 24 hours; Advanced Base Section, which set up and ships complete advanced supply bases where directed by the Naval Command (in February, 1944, 22 complete base assemblies comprising 235 functional components were set up and shipped within 14 days of receipt of order); Allowance Materials Assembly Branch issues the original stock of consumables for new Naval vessels of every type built in the Bay area (today from 30 to 45 craft a day are being provided with an average of over 95 per cent of their full commissioning allowance); and Naval Fuel Annex.

This last branch is located at Point Molate, Richmond, Calif. It provides bulk storage of special Navy fuel oil, 50 octane diesel oil, and 100 octane gasoline, as well as drum storage for a wide variety of petroleum products. The pier can take 4 ships alongside simultaneously and bulk fuel is delivered directly to the side by pipeline. Time for bunkering naval vessels has been greatly reduced.

A recently established Radio Supply Branch provides a centralized source of supply for electronic material.

A Common Services Branch includes all services and operations that are common to the whole depot, such as Public Works, Accounting, Disbursing, Dispensary, the Waterfront Division and the Personal Relations Division.

Loading for Fleet Issue

Waterfront Division is loading, at the present time, an average of 40 ships per month. The Division officer in charge of this work is Comdr. D. R. Capell, who before the war was in the cargo department of the Matson Navigation Company. Fortunately he is very interested in cargo stowage problems, for he has a new one placed on his desk every day of the year. Every ship, every cargo, every requisition for arrangement of issue of cargo is different.

These ships for the most part are loaded for "fleet issue." They have a rendezvous with ships of the fleet at some outport in the Pacific where there is comparatively safe and sheltered anchorage. Barges are sent over from the combatant ships to the supply ship with requisitions for any of the 34,000 Navy supply items. If these items were on the original requisition they are, or should be, immediately available in the cargo without moving too much other stuff. When the ships at rendezvous have had their needs supplied balance of cargo, if any, is unloaded at advanced bases.

With this type of set-up it does not require much imagination to see the complex problems of stowage, dunnage, bracing and stability that confront the Waterfront Division officer and his assistants in their dealing with anything from a 16-inch naval gun to a package of Chesterfields to be loaded in any type of naval auxil-

iary or Maritime Commission vessel that may come in.

The depot piers load out each month an average of 76,000 tons on overseas vessels, and there is a barge movement to and from various Bay points of over 15,000 tons monthly.

Largest Naval Supply Depot

From the moment of its commissioning, eight days after our nation had been suddenly hurled into war, the role played by the Naval Supply Depot, Oakland, has been tremendous. The Fleet engagements in the Pacific, as well as the landings which have been made on one island after another from the Solomons to the Aleutians, have all been accomplished to a considerable extent with material which has flowed in an endless and ever-increasing stream from Oakland, the Navy's largest coastal supply depot.

For March, 1945, the total outgoing tonnage was 361,247 short tons. Stocks of material under the cognizance of the Depot at the present time aggregate over $425,000,000, with shipments inbound in August, 1944, approximating $105,000,000, and outbound $84,000,000. In January, 1945, the dollar value of Navy supplies shipped from the depot skyrocketed to $108,764,000. The outbound measurement tonnage figure for the same month increased to 474,524 measurement tons, which was more than double the figure for the same month the year previous. This tremendous increase in volume has, of course, only been accomplished by considerable expansion of physical facilities, in personnel, and in the efficiency of the utilization of that personnel. The increase in workload during the past year has been handled with an increase in personnel much less than the percentage increase in tonnage handled.

Refrigerated stores under N.S.D. are loaded day and night from Pier 56, San Francisco. Over 75 per cent of the entire refrigerated stores for the Pacific Fleet are handled over this pier. The work load of N.S.D. Oakland doubled in 1944 as compared

(Page Adv. 104, please)



Top: Loading a large rifle barrel. *(Official U. S. Navy Photograph)*

Center: At N. S. D., Oakland, all general cargo is handled on pallets.

Bottom: Supplies of men also leave from the world's largest naval supply depot at Oakland. *(Official U. S. Navy Photograph)*

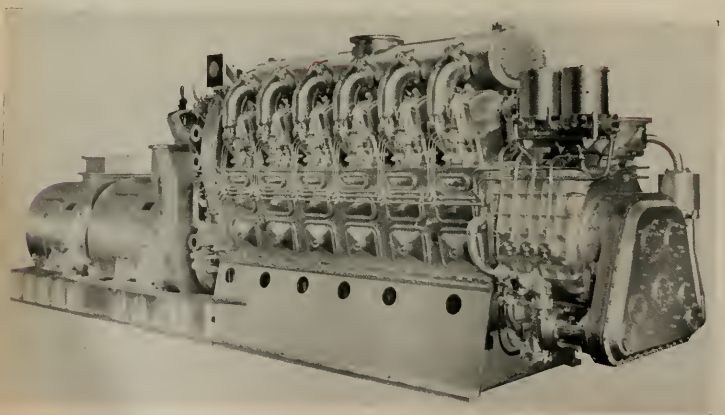


United States Army Engineers dredge Lyman.

Army Engineers New Hopper Dredges

FOUR NEW ocean-going hopper dredges, built to specifications of the Army Engineers Corps' Marine Design Section, have been completed at the Wilmington, Delaware, yards of the Dravo Corporation and are now in operation. These vessels were designed for shoal water dredging under the direction of Colonel Harry B. Vaughan, district engineer of Philadelphia.

Propulsion power is supplied by two 12-cylinder, 2-cycle, 950-bhp, 565-kw, 600-volt D.C. diesel engine generating sets, furnished by the Cleveland Diesel Engine Division of General Motors, which drive the vessels loaded at 11¼ knots and



Two of these 12-cylinder, 2-cycle General Motors diesel-electric drive engines supply power for propulsion and pumping in each of the new dredges.

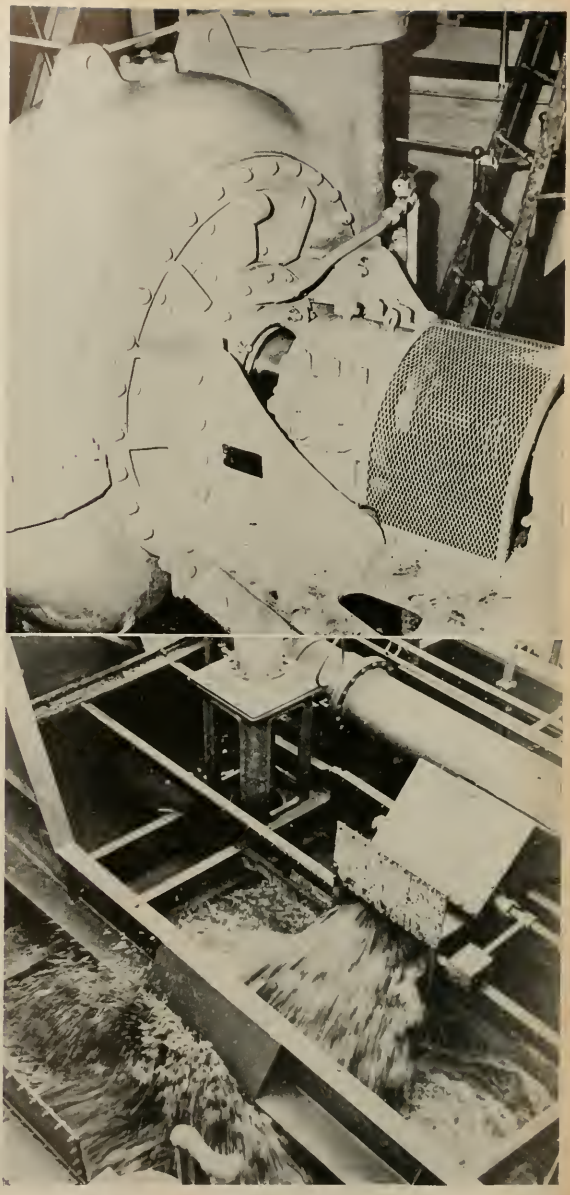
Principal Characteristics	
Length O. A.	215′ 11″
Length, B. P.	212′ 0″
Breadth, molded	40′ 4″
Breadth, over-all	53′ 0″
Depth, molded	15′ 6″
Draft, light	8′ 2″
Draft, loaded	12′ 6″
Capacity, cubic yards	700
Capacity, tons	975
Shaft horsepower	1400
Speed, loaded, knots	11.25
Speed, light, knots	13.3

empty at 13½ knots. Each main engine also drives by direct-shaft connection a 310-kw, 240-volt D.C. generator which provides power for the dredging pump. Auxiliary power consists of two 6-cylinder diesel generator sets and one single-cylinder generator set of same make as main engines.

The design is for twin screws, and each propeller is driven by a 700-bhp shunt wound electric motor through a single reduction gear, set up to a normal full speed of 190 rpm.

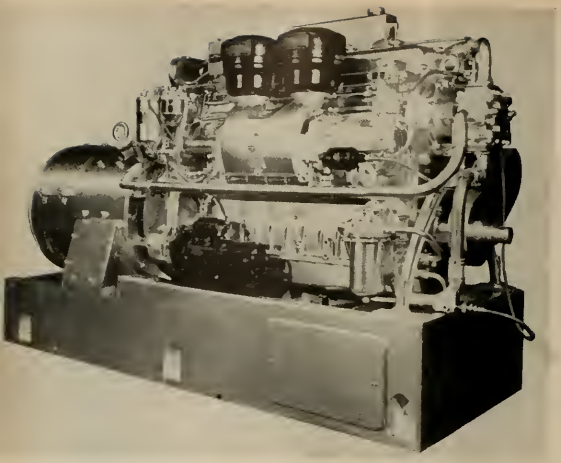
The single twin-suction centrifugal dredging pump, driven by a 420-hp direct current motor, has capacity for filling the hoppers of this dredge with a full load in 36 minutes.

To permit ease of handling in confined harbors and tidal rivers, the dimensions of these dredges have been kept to a length between perpendiculars of 212′, and a molded beam of just over 40′. The over-all beam is 53′, and this includes the 18″ suction drag pipes, which penetrate the hull on each side in way of the pump room. They have common connection with the single dredge pump located on the vessel's centerline, well below the light load water plane. The pump's main 20″ diameter riser is branched into two 20″ diameter discharge pipes, which run over the full length of the eight hoppers. Manually controlled nozzles, operated from catwalks over the hoppers, are provided on these pipes. Hollow steel gates are arranged for manual raising and lowering along the tops of the hopper overflow coamings, which increases the hopper capacity when the dredging of ccr-



Top of page: Dredging pump.

Bottom: Discharge outlets from dredging pumps to hoppers.

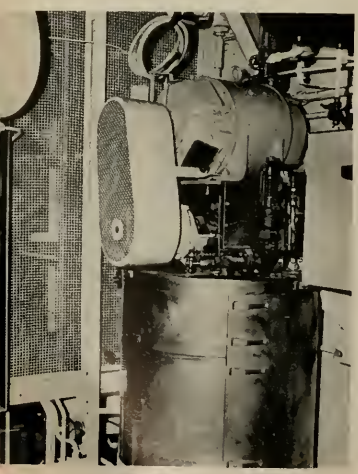


Stond-by power in each vessel is furnished by two 6-cylinder, 60-kw Generol Motors diesel generator sets like this.

in types of material makes this ad-
sable.

The load is dumped through eight
ydraulically controlled doors in the
ip's bottom by an actuating fluid
rce of 300 lbs. per square inch, in-
oduced into as many cast steel cyl-
ders through three-way valves at
ch hopper control station. Con-
int 300-pound pressure is main-
ined in a 55-gallon tank by means of an electrically driven 100-gpm centrifugal pump connected to a reserve oil reservoir. When closed, the doors are mechanically locked shut so that the need for maintaining the hydraulic pressure is removed.

The prime movers and auxiliaries are located in the compactly arranged, sound-proofed engine room aft. The main diesel generating sets are mounted on anti-vibration units.



Evaporator, which furnishes o supply of fresh water for the vessel.

The field control of both generators on each engine shaft allows vernier propeller and dredge pump motor speed.

The compound wound dredge pump motor, through the variable field control method, covers continuously a speed range from 190 to 240 rpm. The propulsion motors have direct electrical control both in the wheelhouse and in the engine room, supplemented by three marine telegraphs on the bridge.

The two 40-hp, 230-volt, shunt wound drag pipe winch motors obtain their power from a specially designed motor generator set consisting of a 75-hp motor directly connected to two 35-kw generators, having sufficient differential series field winding to void the residual field effectively when the shunt field is de-energized. Weather-enclosed rheostats of the "finger tip" type are mounted on pedestals in each drag tender's house. Full voltage may thus be applied in hoisting or lowering the drag pipes by a total lever throw of only 75 degrees. This feature enables the drag tenders to keep the drag heads in proper contact with the ocean floor, a technique which determines the speed with which a pay load may be taken aboard.

A 4-foot-diameter dial, continuously self-correcting for the vessel's draft, indicates the distance between the drag head and the surface of the water. This dial is constantly within full vision of the drag tenders' houses. An indicator on the after drag davits continually shows the transverse travel of the drag head under water, regardless of the ship's list. This is essentially a measure against drag pipe rupture.

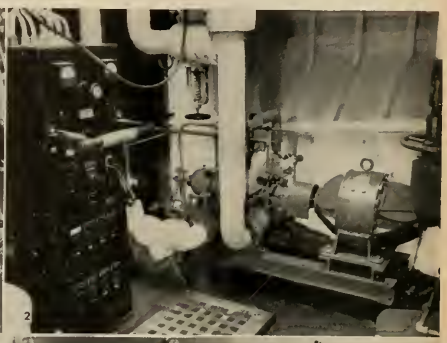
Quarters for a crew totaling 58 are arranged in the forward and after deck houses, and liberal provision has been made for crew recreation lounges. The deckhead and side ceiling of the quarters are of incombustible material, neatly worked into panels. The doors are hollow metal and the steel furniture is finished in mahogany.

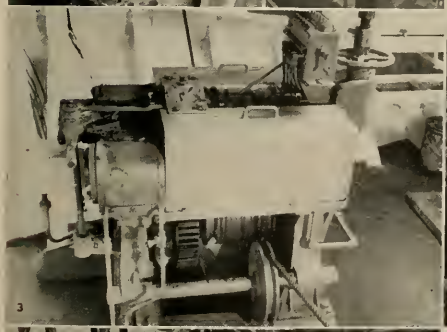
The auxiliary machinery is electrically operated from the excitation bus of the main switchboard, as well as from two independent 60-kw diesel stand-by generator sets. A 10-kw diesel set serves for emergency requirements. Throughout the ship construction and machinery outfitting, the full requirements of the Bureau of Marine Inspection and Navigation have been met.

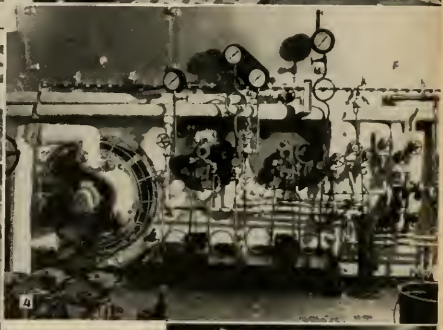
Modern Tug Machinery

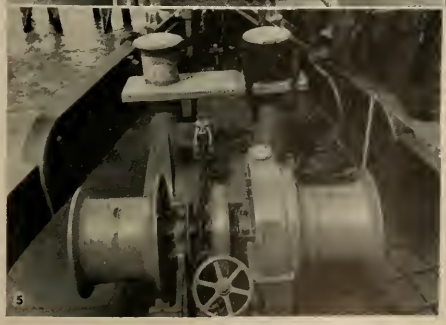
In the June issue we published a complete illustrated description of the Atchison, Topeka and Santa Fe Railroad tug Edward J. Engel, designed by Joslyn & Ryan Naval Architects of San Francisco and built by Consolidated Steel Corporation of Los Angeles at their Newport Bay shipyard. The complete electrical wiring installation on this tug was the work of the electrical subcontractors Ets-Hokin and Galvan's Wilmington branch, located at 218 Avalon Blvd., and was under the supervision of the Southern California manager, Milton Schug. All underwater and topside paints used on the vessel were supplied by the American Marine Paint Company. The pictures of machinery presented here are supplementary to the June article.











(1) Engine room, showing starboard side of Skinner 3-cylinder Uno-Flow steam engine.

(2) Electrical plant. Westinghouse turbo-electric generating set and switchboard.

(3) Markey steam steering engine.

(4) Firing front of Babcock & Wilcox boiler.

(5) Windlass.

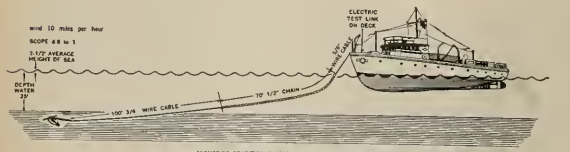
(6) Towing engine.



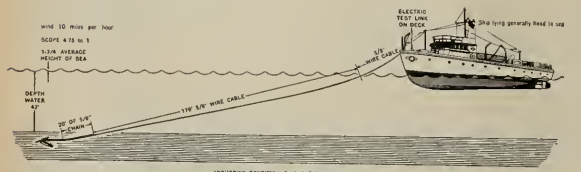
Cables Effect on



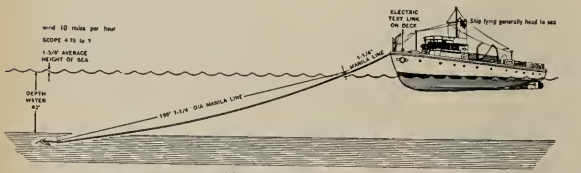
ANCHORING CONDITION A CABLE ARRANGEMENT 1
Average surge load on anchor cable = 4,062
Maximum surge load on anchor cable = 6,480



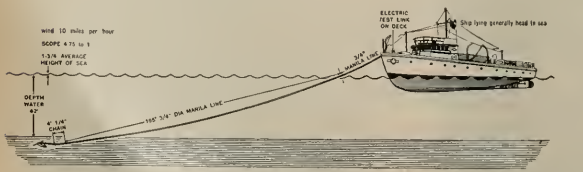
ANCHORING CONDITION A CABLE ARRANGEMENT 2
Maximum surge load on anchor cable = 280



ANCHORING CONDITION B CABLE ARRANGEMENT 1
Average surge load on anchor cable = 808
Maximum surge load on anchor cable = 2,120



ANCHORING CONDITION B CABLE ARRANGEMENT 2
Average surge load on anchor cable = 738
Maximum surge load on anchor cable = 1,910



ANCHORING CONDITION B CABLE ARRANGEMENT 3
Average surge load on anchor cable = 726
Maximum surge load on anchor cable = 1,280

The tests described in this paper show that there is a lot of good sense in the old seafaring saying that "the chain holds more than the anchor."

From this rule, some have assumed that the weight of the chain acted by directly increasing the holding power of the anchor, but various published reports indicate that this direct increase is not large.

The following tests show that the weight of the chain primarily acts to reduce the impact load on the anchor rather than increasing its holding power. This distinction is of the utmost importance, especially when using wire cables for anchoring.

Before examining specific test data, keep in mind that a considerable pull is required to stop a ship which has been placed in motion by the surge of a sea. The amount of this pull, according to Knight's Modern Seamanship, equals 99.3 times the displacement in long tons, times the speed in knots squared, divided by the distance in feet in which the ship is to be stopped. If the ship is stopped suddenly a very heavy load is applied to the anchor.

For example, a 1,000-ton ship surging at a speed of two knots, would require a pull of 100,000 pounds to stop it in a distance of four feet. This pull would be the approximate holding power of a 25,000-pound stockless anchor.

When chain is used, the weight of the chain forms a catenary curve and the load is gradually absorbed in lifting it.

These tests show that the use of chain reduces the maximum load on the anchor to as little as 5 per cent of the load when using wire rope. The tests were made on 104-foot Army Aircraft rescue boats at Monterey, California. Under American Bureau of Shipping rules these vessels should be equipped with about a 550-pound stockless anchor having a holding power of around 2,000 pounds. Any

(Summary of paper read before the Northern California Section, Society of Naval Architects and Marine Engineers, San Francisco, April 15th.)

and Their Anchor Loads

By R. S. Danforth

greater load than this would, of course, drag a single anchor.

In all the tests reported the load due to wind pressure alone is estimated to be between 150 and 200 pounds.

One of the most interesting series of tests is illustrated below. It compares the load placed on the anchor when using all wire cable with the load when substituting one-half inch steel chain for the upper two-fifths of the length under water. Otherwise conditions were identical.

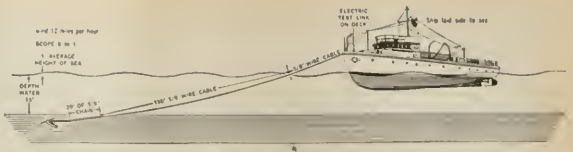
There was no measurable load on the wire rope except when the ship surged on a sea. The maximum load on the anchor was increased from 280 pounds with chain to 6,450 pounds with wire cable. If all chain had been available for the test a slightly lower maximum surge load would have been expected. It will be noted that the pull with wire cable is some three times the holding power of the anchor called for under American Bureau of Shipping rules.

Another interesting test was made to compare the load on the anchor when using wire cable and manila rope. Results, under identical conditions, show that manila rope reduced the maximum load approximately 50 per cent as compared with wire cable. Observations were made for approximately 20 minutes under each condition.

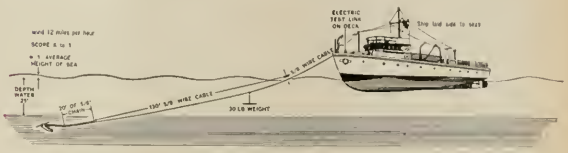
Tests under Condition C showed that suspending a 30-pound weight from the wire cable reduced the maximum load approximately 50 per cent.

Condition D showed that with a maximum sea height of five feet and light winds the surge load reached a maximum of 13,360 pounds, while experience would indicate a load of materially less than 2,000 pounds when using chain.

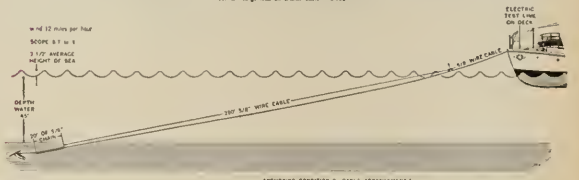
Attention is called to the fact that none of the anchors dragged during any of these tests, which shows that the holding power of the anchor itself was not a factor and that the ship might equally well have been fast to a heavy ship's mooring.



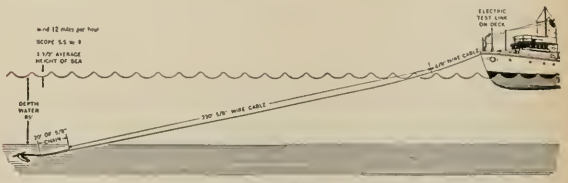
ANCHORING CONDITION C CABLE ARRANGEMENT 1
Average surge load on anchor cable = 4,200
Maximum surge load on anchor cable = 6,10[illegible]



ANCHORING CONDITION C CABLE ARRANGEMENT 2
Average surge load on anchor cable = 1,560
Maximum surge load on anchor cable = 2,900



ANCHORING CONDITION D CABLE ARRANGEMENT 1
Average surge load on anchor cable = 2,060
Maximum surge load on anchor cable = 10,030

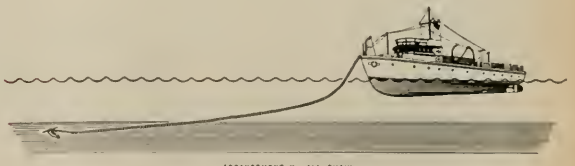


ANCHORING CONDITION D CABLE ARRANGEMENT 2
Average surge load on anchor cable = 11,360
Maximum surge load on anchor cable = 13,360

The load on an anchor may be considered as made up of four components:

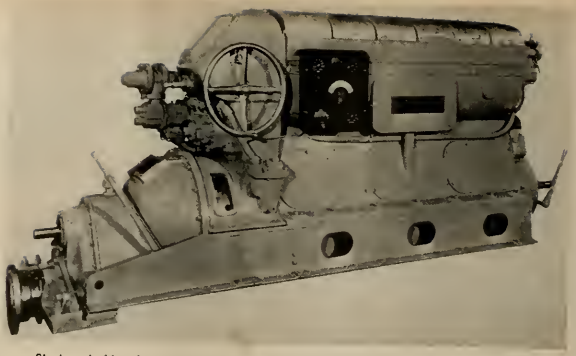
(a) The load due to wind pressure, approximately equal to .0043 AV^2 where A is the cross-sectional projected area above water in square

(Page Adv. 104, please)



ARRANGEMENT X—ALL CHAIN
Recommended as most desirable type of attachment to reduce impact load on anchor caused by surges of the sea.

New Diesel Series



Starboard side of o new 6-cylinder Series 20 Hendy marine diesel, illustrating its trim oppearance. This air-starting, direct-reversing model is conservatively roted at 190 hp ot 900 rpm. Also shown in this view ore reduction gear, sailing-clutch lever, and clutch power take-off at forword end.

Adding to its present line of diesel engines, the Joshua Hendy Iron Works of Sunnyvale, California, is now producing a new Series 20 diesel in 6- and 8-cylinder models with a power range of from 190 to 250 hp at 900 rpm. This extends the line to include horsepower ratings from 190 to 780 hp.

The D-26 and D-28 are made in marine, stationary, and diesel-electric models, and are of the four-stroke cycle, single-acting type, designed for heavy-duty, medium-speed operation. They are air-starting and completely enclosed—with overhead camshaft, unit fuel pumps and injectors, precision-type bearings, and full pressure lubrication. Marine models are direct reversing.

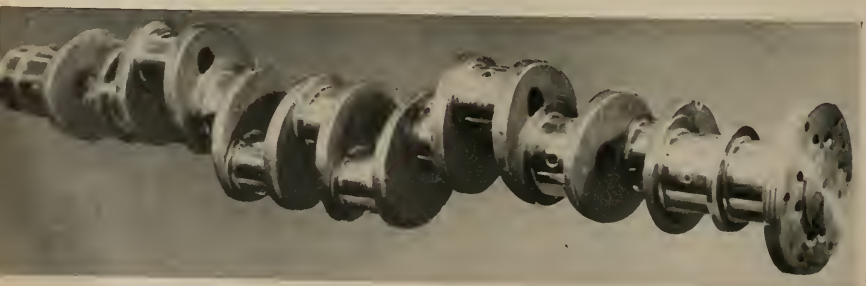
These new engines have cast-iron, mono-block construction with underhung crankshaft, removable cylinder liners, and auxiliary drives arranged at either end. Among the attached accessories are air compressor, governor, water and lube-oil circulating pumps, fuel-transfer pump, lube and fuel-oil filters, lube-oil cooler, and gage board.

Cylinders are 7¼-inch bore and 9½-inch stroke. The cast-iron pistons are of simple design with four compression and two oil-control rings, and with heads designed for maximum heat dissipation and efficient combustion. Full-floating wrist pins are pressure lubricated through drilled connecting rods, forged of high-strength steel, completely machined and carefully balanced for smooth operation. Bearings caps are bolted to rods with oversize alloy-steel bolts.

Cast in special iron, with hollow crank pins and main journals, the crankshaft is dynamically balanced, with all bearing surfaces accurately ground and polished. Lubrication is carried from the main journals to the crank pins through inserted steel tubes. An extra-long rear main bearing supports the flywheel and any additional loads that may be imposed at this end. The bronze-backed precision-type bearings are lightly loaded, and may be removed individually through large side inspection doors without disturbing the crankshaft or any accessories.

Fresh-water cooling is a design feature assuring freedom from rust, scale, or chemical deposits in water jackets and materially reducing maintenance costs. The raw water enters the raw-water pump, passes through a heat exchanger and is discharged. The fresh water is circulated by a centrifugal pump which passes it first through the oil cooler and thence into the engine water header, which is cast integrally in the side of the cylinder block. Entrance of the water to each cylinder space is through a metering hole which gives a tangential swirl around each cylinder liner. It next passes from the cylinder block through two pass-overs to the cylin-

The cast-iron crankshaft of the new diesel is dynamically balanced to minimize vibration at all speeds. Journals are accurately ground and polished and are supported by lightly loaded precision-type bearings to support additional loads that may be imposed at the flywheel end.



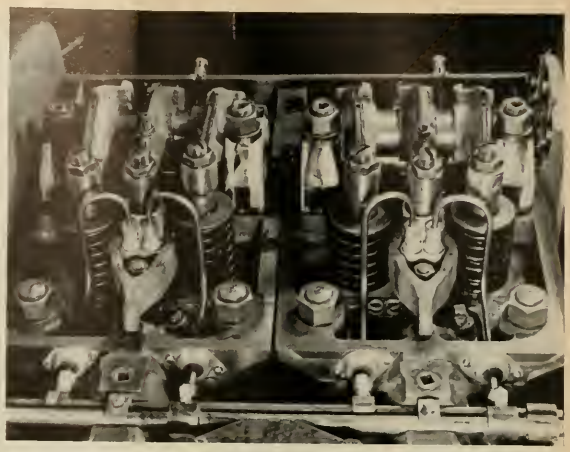
der heads, where it is directed for maximum cooling of the injectors and exhaust valves. The exhaust manifold, which serves as a pickup for collecting the water from each cylinder head, directs the water through the heat exchanger to the circulating pump for recirculation. Temperature control is maintained by a control valve placed in the line between the heat exchanger outlet and the circulating pump.

Cylinder heads are designed for maximum strength and uniform cooling. In each head are the intake and exhaust valves, the unit pump and injector, the air-start valve, and an indicator connection. The air-start valve is operated by a separate tappet arrangement (on the underside of the fuel rocker arm), which functions when the starting air is turned on.

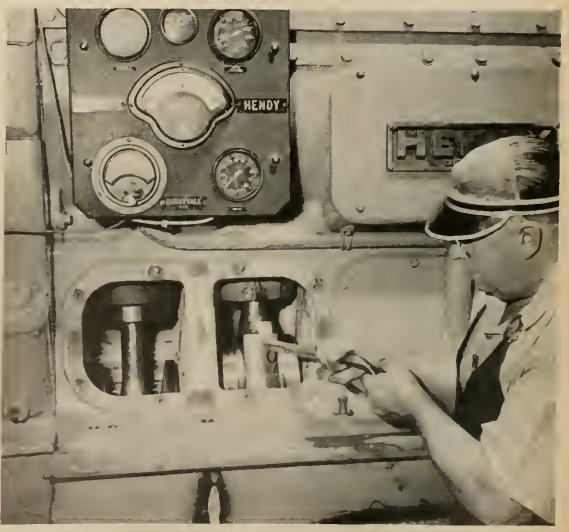
The two-inch-diameter ground steel camshaft is fitted with forged, hardened and polished steel cams. It rotates in precision-type, pressure-lubricated bearings. There are three cams per cylinder: intake, exhaust, and a third performing the dual functions of fuel injection and air starting. This overhead camshaft, which eliminates push rods, is ideal in combination with the unit injection system since the rocker-arm rollers bear directly on the cams, providing a close-coupled, smooth action. The entire unit-injector assembly can be quickly and easily removed for cleaning and inspection, enabling all servicing to be done under proper bench conditions. A continuous flow of fuel through the injectors serves to keep them cool and to eliminate air locks. The engine starts readily without the necessity of bleeding fuel lines. In and out fuel headers are located above the exhaust manifold.

The fuel-control shaft is operated through anti-friction linkage from the governor, with emergency stop levers located at each end. Injectors are connected individually through spring-loaded linkages which allow the operator to shut off any injector during operation. This spring loading also allows the governor to maintain engine speed through control of the remaining injectors in case one should become inoperative in the open position. "Trimmer" adjustments permit accurate balancing of cylinder loads. The standard governor is a conventional mechanical flyball type of ample size. For installations requiring extremely close speed regulation, governors of the hydraulic type may be furnished. The full pressure lubrication system assures positive lubrication of all bearings and moving parts. Oil is forced to the various parts of the engine by a pressure oil pump, with a by-pass valve controlling pressure and an oil cooler controlling temperature, and passes through a duplex fine-mesh strainer before it enters the engine. Subsequently, it passes through a cartridge-type filter, which prevents acidity and sludging. Inside the en-

(Page Adv. 104, please)



Two head covers removed to show the valve and injector assemblies. Low-pressure lines supply fuel to the combination pumps and injectors. Injectors, intake and exhaust valves, and air-start mechanism are smoothly actuated by rocker arms bearing directly on the overhead camshaft. All moving parts receive oil from the pressure lubricating system.



Unusual accessibility of the diesel is demonstrated by this view of crankshaft and connecting rods through an open side inspection door. These large doors, which may be removed on either side without disturbing any other assemblies, afford ample room for inspection and maintenance work.



Western Asbestos Co. workman applying tape over high temperature insulation on a main steam line.

Experience Assures Efficient Insulation



...g canvas over J-M BX18 insula-
tion on a ventilating duct.

THE WESTERN ASBESTOS COMPANY was established by Frank Malloye in 1908, and acted as agents for the distribution and application of Johns-Manville products. During World War I it occupied a dominant position in the furnishing and installation of pipe and boiler insulation in the Bay Area shipyards. Sixty-six destroyers were insulated by the company for the Union Iron Works, now the Bethlehem Shipbuilding Corporation. After 1918 its marine work was supplemented by an ever-increasing volume of industrial insulation, which assisted substantially in the growth of the company.

Since the outbreak of the present conflict it again devoted most of its activities and facilities to the marine field, installing insulation on new equipment and repairing insulation on all types of vessels. It was in an extremely favorable position to capitalize on its great reservoir of practical knowledge, gained in thousands of insulation installations of every conceivable type, and with a specially trained crew of 1000 asbestos workers under the supervision of experienced supervisors, installations have been made in record breaking time.

The key personnel of the company's nearly 100 office and warehouse staff have an average individual experience of over 16 years. The officials of the company, with a background of technical and practical

knowledge of over 25 years, include: Charles B. Purcell, president; Clarke E. Wayland, vice president; Joseph J. Kelly, secretary; and J. F. Connolly, treasurer. The Marine Department activities are under the direction of Emmet J. Ahern, R. C. Hawkins, A. W. Johnson, C. M. Texdahl, J. J. Mahan, and D. G. Barr.

The main office and warehouse is located at 675 Townsend Street, and there is also an additional warehouse and three waterfront stations in San Francisco. Branch offices are maintained in Oakland, Richmond and Sacramento, and three completely equipped fabrication shops are strategically located in the San Francisco Bay Area. Throughout the United States, Western Asbestos Company is recognized as one of the leading contractors and distributors for Johns-Manville Corporation.



Left: Cutting hair felt insulation in the fabrication of removable flange and fitting covers for cold water and drain lines. The company maintains three completely equipped shops for the fabrication of specialized insulation covers.

Below, left: Left to right are Charles B. Purcell and Clarke E. Wayland.

Below, left to right: D. G. Barr, R. C. Hawkins, A. W. Johnson, E. J. Ahern, C. M. Texdahl, J. J. Mahan.





New Service for Western Ship Repair Yards

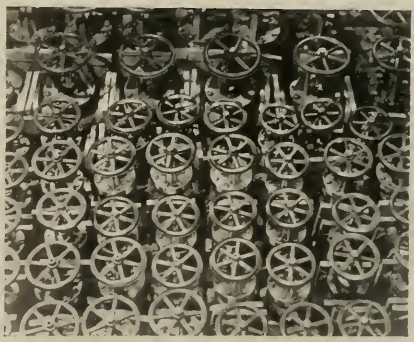
The Fisher Brass Company has made possible a very useful service to shipbuilders and repair yards by establishing stocks of bronze marine valves in three Pacific Coast shipbuilding centers—San Francisco, Seattle and Los Angeles.

Fully aware of the large volume of ship repairs which would be needed after V-E day, and knowing that speed would be mandatory, this company built up and stocked a wide assortment of high quality bronze valves in these three cities.

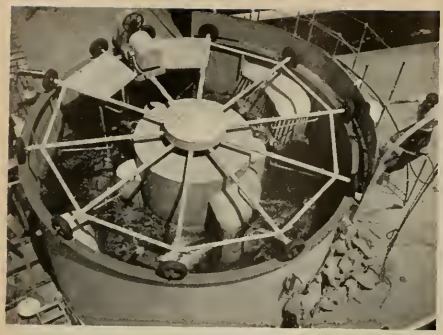
This foundry was founded in 1930, and since 1941 has devoted its entire production facilities to the manufacture of flanged bronze marine valves. Today these valves have been installed in every type of American-built ship. Special fittings for various foreign ships have been produced on rush order.

Fisher Bronze valves have been installed in every type of craft by shipbuilders on the Atlantic, on the Gulf, and on the Great Lakes.

J. L. Fisher and his sons are proud of the job they have already accomplished, and their foresight and alertness in supplying warehouse stocks of bronze valves for immediate delivery will help greatly in hastening V-J Day.



Putting Jackets Over the Jumps



In this tank life jackets are run through an obstacle course to determine the amount of punishment they can take.

A tank for testing the buoyancy and wearing qualities of life jackets has been developed by the Research and Development Division of the United States Coast Guard, working in accordance with an idea suggested by A. F. G. Lucas of the National Inventors' Council.

Built at the Coast Guard Yard, Curtis Bay, Maryland, the circular tank, 18 feet in diameter and 10 feet deep, has a built-in obstacle course through which the life jackets, fitted on dummies and suspended from steel arms, pass.

At 15-minute intervals the jackets are removed from the tank, tested for the amount of buoyancy lost in their jouncing trip around the interior of the tank, and examined for other signs of deterioration. Jackets containing fillers of kapok, fibrous glass and treated cotton are the three types now being tested.

Five jackets may be run through the tank in one test. Three speeds—classified as swimming, walking and running—are used in the testing procedure, and the power which revolves the five jackets around the obstacle course is supplied by a 3-hp electric motor with vee belt drive. Further to simulate actual wearing under all conditions, the jackets can be run through the obstacle course dry or with the tank filled with water.

In the accompanying pictures, steps in the testing procedure are shown.



Upper left: The first step in the life jacket testing procedure is shown here as a Coast Guard officer fits a jacket on a steel dummy preparatory to its trip around the interior of the tank.

Upper right: After the jacket is fitted to the dummy, Coast Guardsmen use block and tackle to hoist it into position on top of the tank.

Lower left: The dummy with its jacket is shown in position for testing.

Lower right: After immersion in the tank, life jackets are removed and weighed to determine the amount of water they have absorbed.

Pacific WORLD TRADE



By T. Douglas MacMullen

The San Francisco Charter

"What a great day in history!" exclaimed President Truman at the final session of the San Francisco Conference.

Without sacrificing the rights of any country, the Charter outlines an organization that is strictly national and not at all international in scope. No country's interests are sacrificed. The spirit of the Charter, and its effect, might be expressed in the hymn:

"You go to your church and I'll go to mine,
But let's walk along together."

Together, but as separate entities, jealous of their rights and prerogatives, the nations will try to prevent the resort to war, and eventually to eradicate the causes of war. When ratified by the United States, Great Britain, China, France and Russia, plus twenty-three of the forty-five other nations, the United Nations organization will be in effect. Very similar to the old League of Nations, except that military force will be available to preserve peace, and as if to emphasis of the League's weakness. the major accomplishment of the San Francisco Conference will have been the winning of the United States and Russia to the cooperative endeavor.

Organization

Apart from the three executive groups—the General Assembly, the Security Council and the Secretariat—the operative organs of the United Nations will be the Economic and Social Council, the International Court of Justice, and the Trusteeship Council.

In the first of these, the Economic and Social Council, will be decided matters relating to foreign trade and shipping, the economical and industrial welfare of invaded territories, drug control, education and health. It is understood that another Conference will be called within two years on trade and tariffs.

The International Court of Justice will be a substantial continuation of the old Permanent Court of International Justice at The Hague and the new court will meet at The Hague. It will deal with legal disputes between nations and can call on the Security Council to enforce its decision.

The Trusteeship Council will deal with mandates, conquered enemy territory, such as the Pacific islands, and is pledged to promote the welfare of backward peoples and help them advance toward self-government.

A great stride has been taken toward peace. As Lord Halifax said on calling for a final vote on the Charter, "This is the most important vote you will ever cast." The unanimous approval shows how the world is thinking.

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AUGUST

Foreign Trade in Mining Machinery

United Fruit Co.'s Development Program

Inland Cities and World Trade

"THE VALUE OF OUR FOREIGN TRADE WILL BE A MEASURE OF OUR PROSPERITY"
—U. S. Chamber of Commerce

World Trade Follows Industrialization

By E. F. Callahan
Vice-President
International General Electric Company

When any man tries to predict what the trade possibilities are for the Pacific area and of Central and South America after the war, that man is taking on a sober responsibility toward his fellow men and business associates.

In fact, any man in these times who tries to predict what tomorrow may bring is treading on thin ice. As the Boston Globe pointed out recently: "The condition of the rest of the world may be gauged from the fact that a jungle valley in New Guinea inhabited by ill-tempered, spear-bearing, native 6-footers is described as Shangri-La."

However, if we look at future trade possibilities in Central and South America or anything else for that matter, from that viewpoint, it wouldn't be long before this old world would be an even sorrier mess than it is now.

Mr. Clark H. Minor, president of I.G.E., once said, "The records show that American exports are largest to those countries where industrialization has been greatest." His statement was based on facts and figures, which are as irrefutable today, and will be tomorrow, as when he said them.

Basing our argument on that proved theory, then the future trade with the Pacific area and South America will depend almost wholly on the expanding industrial economy of the nations on that continent.

In the past years, before and during the war, the South American countries have expanded this industrial economy. Some of the countries have been more advanced than others, of course. That is only natural. And it will undoubtedly hold true in the years to come.



E. F. Callahan

The expansion of the past has not come about overnight by any manner or means. It has been a long, slow process, as it was in our country up until about the middle of the last century, when our industrial expansion suddenly burst forth. And, even then, we did not attain our full growth until a whole century had elapsed.

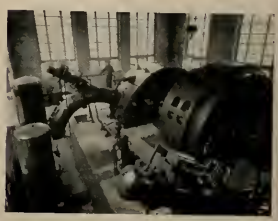
There are many theories and arguments as to why America suddenly grew into an industrial nation with the resultant benefits of a higher level of living for its people. Some say this "industrial revolution" was due wholly to Bessemer's steel process; others attribute it to Eli Whitney; to Goodyear; to McCormick.

Whatever the reason or reasons, they are only mentioned because our own case helps us to see what may lie ahead for our good neighbors to the south of us. They have the natural resources upon which they can build an industrial economy, which in turn will help to promote a better standard of living for their people They have built some factories and probably will continue a slow but steady progress in this direction. There has been a ten to twelve per cent increase in power consumption every year. For at least twenty years there has been a shortage of power.

Many of these nations will have adequate power-making facilities in certain areas in the reasonably near future. In the other areas where power facilities are inadequate these same nations are pushing plans to erect new power plants. Among these countries Chile has made elaborate plans for hydro-electrification and power development. Projects such as Pilmaiquen, Abanico, Sauzal and others are planned to make available low-cost electric power to develop the natural resources of the country and to reduce production costs in the factories and mines. These projects will also help to diversify Chilean industry, thus broadening the scope of work-opportunities for Chilean workers, and thereby help to improve the standard of living.

Throughout South America I.G.E. and other companies too have made important contributions to the industrial growth of the various republics. Plants have been constructed in Brazil, Argentina and Uruguay, where diverse electrical goods such as radios, refrigerators, meters, small appliances, lamps, transformers and motors are manufactured for local consumption.

CHILE—Interior view of the Volcan Plant of Cia Chilena de Electricidad, showing two General Electric 12,500-kva turbine generators.



Pacific World Trade



PERU—Exterior view of substation of the Molpaso hydroelectric station, showing three General Electric 17,000-kva transformers and two General Electric 750-kva transformers.

In Colombia, I.G.E. has branches in the four major centers of population—Barranquilla, Bogata, Medellin and Cali. Colombia is advancing industrially, and is rich in natural resources. These resources have helped her economy. But more widespread electrification will help her to expand industrially the same as it will help the other West Coast countries such as Peru, Bolivia and Chile.

Recently Ralph Johnson, general sales manager for I.G.E. in Colombia, stated that the country will be one of the important post-war markets in South America for machinery made in the United States. However, its purchases of consumer and consumer-durable goods will be limited, Mr. Johnson said.

"Under the guidance of its Fomento Industrial, Colombia is becoming one of the richest of Latin American nations," Mr. Johnson said. "But its aims to produce its own consumer goods will reduce its imports of such United States goods. And until it either raises its per capita income or we lower our prices, it will not be able to buy consumer-durable goods in the quantities popularly predicted."

The Fomento Industrial's plans for expanding Colombian industry will, of course, stimulate imports of durable goods of all kinds from the United States, Mr. Johnson pointed out.

As for I.G.E. the company has embarked upon a program designed to stimulate a greater utilization of the natural resources of foreign countries through electrification. This program has led to the establishment overseas of local manufacturing plants, particularly where the economy of such countries is developed for such diversification and where large amounts of electric power are readily obtainable.

For example, in Mexico, I.G.E. already has established two large lamp factories in Monterrey — Lamparas Electricas Mexicanas—where native Mexicans are engaged in the manufacturing and engineering operations for producing incandescent and fluorescent lamps.

General Electric has played a leading part not only as a manufacturer in Mexico, but as a supplier of electrical equipment for practically all of the industries there today, such as petroleum, textiles, sugar, steel, etc.

The erection of G-E lamp factories and the company's willingness to contribute in large measure to the local economy is in keeping with its policy to expand its manufacturing facilities abroad whenever such expansion is economically sound—and whenever it will result in higher living standards in those countries.

Of all the countries of the far Pacific, the Philippines may be taken as an example of the way an expanding industrial economy may bring better living to the war-torn Orient. Even though the Philippines economy is largely agricultural, the benefits of industrial America have most certainly been showered upon her.



COLOMBIA—Interior view of the "El Salto" Plant of Empresas Unidas de Energia Electrica, showing two General Electric 12,500-kva generators.

Pacific WORLD TRADE

Brig. General Carolos P. Romulo, Resident Commissioner in the U. S. of the Philippine Commonwealth, said some time ago that before the war wherever he went in the Orient the natives asked him if it were really true that the Filipinos were paid fair wages and owned the products they raised on their own land and made in their factories. When he told them all these things were true of the Philippines he said he could see the wonder in their faces.

In other words, if future trade in the Orient is to advance and progress then the natives of those countries must realize, as we do, and as do South Americans, that industrialization means a better living economy for their peoples.

The natural resources of the Orient are fabulous. These resources have been exploited—but their riches have hardly been touched. Now those resources are being scourged by the Japanese. Only a few days ago the newspapers reported that the enemy had set fire to the richest oil fields in the British empire—the ones near Brunei on the north coast of Borneo.

How much harm has been done to the natural resources by the Japanese, no one can tell now. At present it is almost unpredictable how soon and how much trade can be developed in that area after the end of hostilities. For the **industrialization** of the Orient depends upon the availability of the natural resources; the ease of their distribution; and, above all, political and economic peace.

MEXICO—Exterior of General Electric incandescent lamp factory in Monterrey, Mexico, Lamparas Electricas Mexicanas S. A.



Are Financial Resources Adequate For Post-War World Trade?

By E. Leuenberger
Assistant Vice President and Manager, Foreign Department
Wells Fargo Bank and Union Trust Co.
San Francisco

The general assumption that the ravages of the World War II and its colossal cost will cause widespread national bankruptcies, has generated the belief in many minds that the future of a two-way world trade is hopelessly doomed and that our only salvation will be to fall back on our own domestic market. Let us examine if this view is borne out by the financial developments as they deploy themselves in the present world drama, and the outlook for the future.

At the end of 1941 the revealed gold stocks held by all the countries of the world, with the exception of the United States, was $8¾ billion of which ¼ was held under ear-mark in the United States. It is estimated that a further amount of $2 billion in gold is held by various foreign government agencies and by individual hoarders in undisclosed accounts. If we add to this amount short term investments and bank deposits in this country amounting to $3½ billion, total foreign owned gold and dollar banking funds were probably in excess of $14 billion. In addition, it is estimated that foreigners held, at the end of 1941, some $3 billion in stocks and bonds of the United States and $3½ billion dollars in direct and other investments in this country, bringing the total to more than $20 billion.



E. Leuenberger

As the war proceeded, payments due by us to foreign countries rose rapidly. Strategic material on a very large scale had to be imported from foreign countries. The acquisition of air bases and various industrialization and agricultural programs in foreign countries tended to augment the outflow of dollar funds. The balance of payment by this country to other countries was further accelerated by the financial expenditures of our Armed Forces abroad. For instance, it has been estimated that our troops in Australia are spending an average of some $200 million a year for goods and services, and during the campaign in North Africa some $400 millions per year in Egypt. Through these various sources the dollar funds held in this country by foreign owners increased steadily and at an accelerated rate. Besides, practically all the new gold production outside the United States has been retained abroad. The gold production in the past two and a half years totaled well over $2 billion exclusive of Russia. Thus the approximate status of foreign gold and short term dollar resources outside of the United States, by June 1944, was as follows:

	Billions
Gold held outside the United States	$14.670
Foreign banking funds held in the United States	5.930
	$20.600

By the end of 1944 this amount may well have increased to $22 billion with likelihood of a further increase in 1945. This figure does not include foreign owned American securities and direct investments. It may be interesting to note that in the period immediately following World War I, the total foreign gold and short term balances were only about $5 billion. In addition to these huge holdings of gold and dollar balances there have been accumulated by foreign holders, substantial balances of Sterling but since the use of these Sterling assets is at present limited to the so-called Sterling Area countries, the subject will be dealt with separately later.

How are these enormous holdings of gold, dollars, and Sterling distributed? Almost all of the countries outside of the continent of Europe have benefited by the huge waves of U. S. and British spending for the war effort. The chief beneficiaries have been the Latin American countries whose gold and dollar holdings have trebled in the period 1939 to 1943. Gold and foreign exchange held by our southern neighbors increased from $900 million in 1939 to $3 billion over the period, and probably reached in excess of $3.8 billion by the end of 1944. In North Africa, India, and Australia substantial amounts of foreign exchange were similarly accumulated through the heavy expenditures of the Armed Forces of the United Nations. The same holds true for several of the near East countries.

On the continent of Europe many countries have been able to add substantially to their monetary reserves

in gold and foreign exchange assets. This particularly is true of the neutral countries of Europe, namely Switzerland, Sweden, Portugal, and Spain. Moreover, some of the occupied countries were able to conserve their pre-war holdings of gold and dollar balances. As you are aware, the latter were subsequently impounded by the U. S. Government to prevent transfer to the Axis powers when the progressive occupation of the invaded countries took place.

Gold holdings of the principal European countries as recorded at the end of 1943 were:

Switzerland	$ 964 Millions
Sweden	384 "
Portugal	161 "
Spain	91 "
France	2000 "
Netherlands	500 "
Belgium	734 "
Roumania	316 "
Czechoslovakia	61 "
Denmark	44 "
Hungary	24 "
Bulgaria	25 "
Total	$5304 Millions

In addition the following European neutral countries held sizable foreign exchange reserves as follows:

Switzerland	$ 19 Millions
Sweden	145 "
Portugal	483 "
Total	$647 Millions

It is obvious that most of these countries have enough gold and foreign exchange to take care of their requirements in the immediate post-war period. Indeed, a number of these countries will even occupy a creditor position with respect to their gold and foreign exchange holdings. The countries who will be temporarily under the military government of the United States will receive the benefits of an appropriation by the U. S. War Department of an amount in excess of $500 million for relief purposes. Similar appropriations have been made by the other armies of the United Nations.

Another important activating force for the international reconstruction of the world will be the capital-generating power within the confines of each individual nation. As an example of the recuperative powers in this direction, I might mention the stabilization of the German currency in 1925 and the subsequent generation of new capital in that country under the most adverse internal and external conditions that prevailed at that time.

There is no gainsaying that the many countries will need for the post-war period substantial credits for relief, for the reconstruction of devastated areas, and for the stabilization of weak currencies. However, it should be remembered that with the substantial gold assets already held by many foreign nations and still being accumulated at the present time, the world will likely require much less credit from this country than has been generally anticipated, with one possible exception—Great Britain.

Great Britain

In August 1939 the total amount of British investments abroad, including gold, dollar balances, and private investments was approximately $18 billion. Out of this amount gold and dollar balances amounted to $4.483 billion. Before the British Government instituted the British Foreign Control some $300 million were withdrawn by foreign holders. Subsequently the British Government req-

uisitioned all the foreign assets held by their own nationals in exchange for Sterling funds and thereupon proceeded with the sale of foreign assets to pay for their overseas requirements. During the first three years and before the advent of the lend-lease, dollar securities in the following amounts were disposed of by the British Government:

1939	$144.530 Million
1940	170.931 "
1941	227.271 "
	$542.732 Million

Subsequently, in order to prevent the forced sale of additional securities, the Reconstruction Finance Corporation arranged a 15-year loan of $425 million to the British Government against marketable collateral valued at $450 million. The rate of interest was fixed at 3% per annum. Only $390 million was used by the British Government and by July 31, 1944, $125 million had been repaid. By the end of 1940 Great Britain had



spent $2.316 billion of her own resources of which ¾ were paid for in gold, 10% in dollar balances, and the balance through liquidation of foreign securities. By the end of 1943 Great Britain had expended some $6 billion in addition to lend-lease amounting to $6.594 billion against which Britain supplied return lend-lease of $1.563 billion. For the British requirements supplied by Canada, Great Britain initially paid in Pounds Sterling, but between September 15, 1939, and March 31, 1942, the deficiency in Canadian Dollars was $1.870 billion. This amount was paid for partially in gold and partially by repatriation of Canadian Securities held in Great Britain. The balance was permitted to accumulate in Sterling balances. Notwithstanding the repatriation of $840 million by Canada, the balance accumulated in London by Canada was $780 million. In May 1943 Canadian securities held in London were still $1 billion but no further repatriation took place. The next step was the conversion of $700 million in Sterling balances by Canada into a long term loan free of interest for the duration. In addition the Canadian Parliament authorized an outright gift to Great Britain of $1 billion. This amount was exhausted by the end of 1942. In May 1943 an additional appropriation of $1 billion was made by Canada, this time on a lend-lease basis in a somewhat modified form.

Expenditures by Great Britain in India on balance amounted to $2.892 billion. All of this amount was offset by repatriation of Indian securities held in Great Britain. In spite of this operation, however, Sterling balances in favor of India steadily increased, until in July 1944, India held in London the equivalent of $3.008 billion in Sterling balances. The total shift in the five-year period in favor of India amounted to $4 billion. In the period from 1939 to 1943, Great Britain incurred a total deficit of $12.691 billion, exclusive of lend-lease. By the end of 1944



it will no doubt have reached $15 billion. This deficit has been made up as follows:

(In Billions of Dollars)		
Deficit ending 1943		$12.292
Increase in Sterling balances	$4.6	
Increase in external debt	1.012	
Repatriation of foreign investments	2.740	
Liquidation of securities in U. S.	.700	
		9.052
Sale of gold and U. S. Dollars		2.120
		$11.172

This leaves a difference of $1.120 billion unaccounted for which no doubt is due to different accounting methods. It is estimated that at the end of the war Great Britain will still have left in foreign investments an aggregate amount of $9.580 billion exclusive of investments in the Far East and in Europe. This amount just about covers the Sterling balances plus direct foreign loans that comprise the obligations the British Government is owing to foreign countries.

In 1938 Great Britain received an income from overseas investments of $800 million. Due to repatriation and disposal of foreign investments, the amount will probably be reduced to less than half. If, on the other hand, the Sterling balances now carried free of interest should be invested in 3% British Government Bonds, the total annual net decline in British income from foreign investments may reach $500 to $550 million. To this decline must be added a loss in income from British shipping, which loss is estimated to amount to about $200 million annually. It is obvious that a shift of such magnitude in the income of an empire nation cannot be adjusted by ordinary economic remedies. As a first step, no doubt the British Government will continue the financial control of the Sterling balances held in London by foreign interests, to be subsequently followed by lending operations over a long period of time but as the interest service will in effect constitute a heavy burden on the British foreign trade for years to come, it is conceivable that some of the countries that are direct beneficiaries of British foreign trade may entirely remit these obligations, or at least a part thereof, possibly in return for immediate trade and other economic advantages. At all events, the British financial problem will remain one of great magnitude. It is, however, capable of solution and should be solved by relinquishments in favor of Great Britain, if necessary, if the world is to see a return of normal conditions in the not too distant future.

United States

The United States will emerge from World War II as the chief creditor nation in the world. Due to its large domestic market it has never been as vitally dependent on foreign trade as most of the other countries. Expressed in percentages, the actual figures reveal that its foreign trade has been about 10% of its domestic commerce. Nevertheless, the total

Pacific WORLD TRADE

economy of the country has always been vitally affected by adverse factors in its foreign commerce and with the possibility of recurrent unemployment visiting upon us at a critical time in the post-war period, it is very important that we explore with most diligent attention the large opportunities of our post-war foreign trade. As a world creditor nation, we will practically be in an unchallenged position, and our responsibilities in this creditor position to the rest of the world will be very great, indeed. Our interest in a lasting world peace alone will be a compelling reason for our active participation in the development of the resources of other foreign countries since only through such action will they be in a position to buy our products on the scale required to bring about a betterment in their lot and an increase in the general standard of living, not to mention the favorable effect such a course will have on our employment situations at home.

Our exports in recent months on an annual basis have been running at approximately $14 billion (exclusive of shipments to foreign countries by the Army and Navy for the use of the Armed Forces) of which about $2.8 billion represent exports of civilian goods for cash and $11.2 billion lend-lease export. The lend-lease shipments have remained stationary for some time and showed a decline during 1944, while exports of civilian goods showed a gradual upward trend since the first quarter of 1943. The lend-lease shipments have undergone a drastic decline since the end of the war in Europe, while the upward trend of cash trade will now become more pronounced.

Imports, on the other hand, have been running at peak figures, although they originated from areas which in prewar times supplied less than 60% of the total imports. In 1944 the total imports exceeded $4 billion, a figure which had not been reached since 1929. While obviously a good proportion of this amount represents imports due to wartime factors, recent imports from Latin America consisted largely of commodities of the pre-war trade, such as coffee, sugar, petroleum, oilseed, fruits, and vegetable oils which have been running at levels substantially higher than in pre-war periods. This is partially explained by the high level of industrial activity and the national income in the United States. It is conceivable, however, and even likely, that if the high level of production should continue in the United States, imports from Latin America will continue on a substantial level and possibly even exceed the present peak of $1.6 billion for the year 1944.

Post-War Foreign Trade

In the past the volume of our foreign trade has always been directly related to the total volume of our economic activities. Assuming therefore that our industrial production will reach new peaks in the post-war period as it needs be if we are to attain the coveted goal of full employment, it follows that our foreign trade will also reach new peak levels. Our export trade, however, will, of necessity, be limited to the total supply of dollars available to foreign countries which are in turn made available through our imports from those countries, payment for services, and new foreign investments. As our exports in recent years have exceeded our imports, it

(Continued on page 411)

Peru

Land of History and Trade Opportunities



When, in 1535, Pizarro led an expedition into what is now Peru, he discovered a strong and cultured race, the Incas, ruling an extensive empire of 12,000,000 subjects whose history and culture extended back many centuries. Today, in Peru's half million square miles live about 7,900,000 persons, roughly approximating the population of California. They have succeeded in developing their country's natural resources and have elaborate plans for new industries.

Peru is so situated geographically that it is really three separate areas. The narrow coastal strip from twenty-five to one hundred miles in width is dry and sandy except for swift streams from the mountains. About 22 per cent of Peru's population is located in this area.

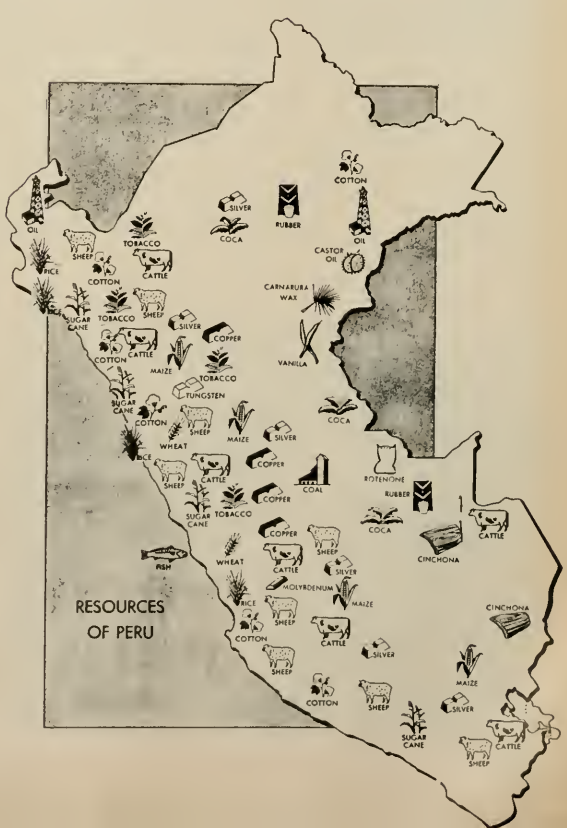
A region of high plateaus and the higher peaks of the Andes make up about two-thirds of the country and two-thirds of its population.

The eastern slope of the mountains form the third section. They descend into the jungle valleys of the upper Amazon country.

Peru is generally thought of as a Pacific Ocean country and it does lie at the western bulge of South America, but it has the remarkable feature of a port that is reached from the Atlantic. Beyond its central mountains, the **average** height of which is 17,000 feet—2,000 feet higher than the highest peak in the United States—is the city of Iquitos on the navigable headwaters of the Amazon River and 2,300 miles from its mouth. Because of the intervening Andes, it is actually easier for Iquitos to do its trading with Brazil and Atlantic Coast points than with Western Peru and the Pacific.

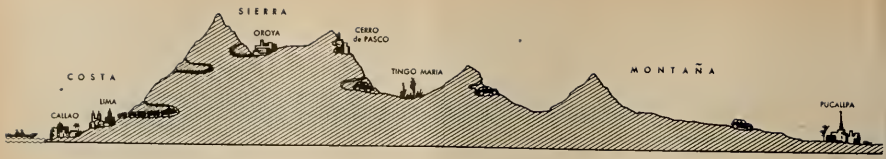
Peru is a storehouse of metals. Copper, silver, gold, bismuth, vanadium, tungsten, molybdenum, lead, antimony and zinc are dug from its mountains, which form one of the chief bismuth and vanadium centers of the world. Metals and minerals account for about 60 per cent of the value of Peruvian exports.

In the coastal valleys there is much cotton and sugar and some rice, but guano, used for fertilizer, is also one of Peru's natural resources, and this is again due to Peru's geographical position. The Humboldt Current

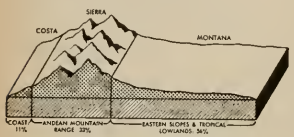


Pacific World Trade

JULY • 1945



flowing north from the icy Antarctic brings cooling air and millions of fish rich in nitrogen. For countless centuries, birds living on the islands off the coast have feasted on these fish and deposited a deep layer of guano all over the islands which requires pneumatic drills to loosen. Domestic production of fertilizers in the



United States, however, has in recent years reduced the importation of guano to this country.

Although Peru already ranks third in South America in per capita use of power, exceeded only by Argentina and Chile, plans for greater power output have been made and three new hydroelectric projects will provide all inhabited sections of Peru where industry is practical with low cost irrigation as well as power.

The chief commercial, financial, industrial and distribution center of Peru is the capital, Lima, ancient "City of Kings", with a population of 523,000. Around it revolves the life of fully a third of the nation. Eight miles away is Lima's port city of Callao. Together these two cities constitute the principal manufacturing center of the country.

There is much opportunity for development in Peru for only 42% of the population are literate compared with 85% in Argentina, 82% in Costa Rica, 76% in Chile, 65% in Uruguay, 55% in Mexico and 50% in Brazil. Newspaper circulation, radio sets, telephones, automobiles, railway mileage and motion picture seating capacity follow about the same trend.

Peru's imports and exports greatly favor the United States and it is probable that the expected increases which the future promises will be mainly with this country. In the immediate future, Peru's imports will be principally machinery and supplies for mining, industries and agriculture; hardware; electrical equipment; vehicles and transportation equipment, dyes, chemicals and clothing.

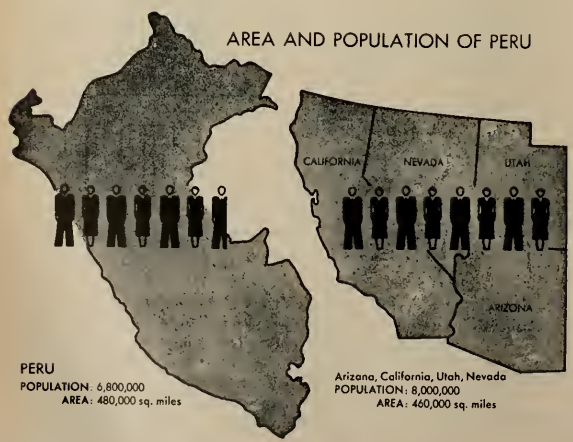
Study of Foreign Languages to Promote International Ties

The British Secretary of State for Foreign Affairs has appointed a strong interdepartmental commission to examine the facilities available in Britain, in universites and other educatonal institutions, for the study of languages, histories and cultures of the countries of the Near and Far East, of Eastern Europe and of Africa. The Foreign Office feels that the study of foreign languages is the key to the extension of knowledge among the British peoples of the traditions, culture and current problems of foreign countries in order to strengthen and broaden ties with other lands. It is hoped that more British scholars will be encouraged in their studies and research about foreign countries, and that British people who go abroad in Government service or on business will be able, before leaving the country, to learn something of the habits and languages of the people among whom they intend to work.

That such a program should find wider encouragement in the United States is the opinion of many prominent foreign traders and others concerned with the expansion of business abroad. The efforts of Basil Harris of United States Lines to focus the attention of colleges on shipping and trade may lead to more interest in languages. Almost every shipment requires the use of weight and measurement standards and foreign money conversions. The more languages an export or import manager knows, the more successful he is likely to be.

Perhaps the steamship companies, whose interest in the growth of foreign trade is more vital than that of most shippers, might individually or collectively sponsor language classes for their clients, especially in major port cities.

AREA AND POPULATION OF PERU





Six sister ships of the pre-war Great White Fleet of the United Fruit Co.

Bananas—
World Trade in a Germ-Proof Cover

To most of us, bananas are just a fruit we can't get, but bananas have an importance in the economy of Central America and incidentally of the United States and the shipping industry which few people suspect—an importance that will grow by leaps and bounds in the early future.

There are about 100 bananas in a bunch and in 1939 the exports from the Caribbean countries totaled more than 86 million bunches (or stems). They came from the entire Caribbean area in approximately the following quantities:

	Bunches
Jamaica	18,803,000
Mexico	13,486,000
Honduras	12,288,000
Guatemala	10,018,000
Colombia	7,118,000
Guadaloupe	5,835,000
Panama	5,284,000
Cuba	4,755,000
Costa Rica	3,400,000
Haiti	2,030,000
Nicaragua	1,602,000
British Honduras	633,000
Santo Domingo	821,000
Windward Islands	326,000
Venezuela	48,000

Assuming 3 bananas to a pound and a very low valuation of 10 cents a pound, the figures quoted above reach a value of $290,000,000. There is more to their importance than mere dollars, however. Bananas are the principal export product of many of the countries mentioned and the entire economy of such countries is centered in this crop. In an early issue, we will expand a bit on the place of the banana in the development of our neighbor countries.

The most important American port for the receipt of bananas is New Orleans, followed closely by New York. These two cities take about 40 per cent of our totals, Pacific Coast cities being far down the list with about 4,000,000 bunches. Much of the effort toward popularizing the fruit has been made by the United Fruit Company and every effort made on the Pacific Coast toward developing the banana market will encourage United Fruit's steamship operations on the West Coast, an objective greatly desired by the traveling and shipping public.

The earliest home of the banana is presumed to have been in the tropical regions of Southern Asia where it is known to have flourished in 600 or 700 B.C. It has at one time or other been grown in the tropical

Bringing fruit by mule to loading platform in Honduras.



regions around the world and seems to have found its ideal home in the Caribbean region, in Northern Africa and Canary Islands. The plant develops rapidly and begins to produce in from twelve to fifteen months after planting.

There is more to the banana diet than pleasant and convenient eating. It is said to be almost an ideal food with far more calories and percentage of carbohydrates than apples, oranges, peaches, grapes, cherries, strawberries or melons. It has the peculiar quality of developing to best advantage after picking. Despite the facts to the contrary, the belief exists in some minds that one should eat bananas ripened on the tree. The truth is that no resident of the tropics eats bananas directly from the tree if he can avoid it but follows the same practice as do the exporters.

When harvested the banana is green and hard and its carbohydrate content is almost entirely starch. During the process of ripening, this starch is converted into easily digested sugars. The skin acts as a color guide to tell when the fruit is ripe. When the peel is yellow except for a green tip, the pulp is firm, somewhat starchy and a little tart. In this partially ripe condition, bananas should not be eaten raw, but should be left in room temperature until completely yellowed and flecked with brown, at which fully ripe stage practically all the starch has been converted into fruit sugars and the flavor fully developed.

Close-up of developed bunch on plant in Costa Rica.





Stowing bananas in hold of steamer.

It will be good news to the banana loving public that importations are again reaching sizable proportions and it is expected that during the coming year, the supply will be normal. The United Fruit Company is building more and better ships to handle the cargo and other intercoastal services are preparing for an increasing tonnage.

It will be well worth while for Pacific Coast foreign traders and shipping interests to take an active part in the promotion of the banana market. There is probably no one item that is capable of producing so much in the way of reciprocal dealings as this much-sought-after fruit. Its possibilities are suggestive of similar possibilities in the development of markets for other imported items which not only swell the totals of international trade but also provide business for shipping interests and promote the welfare of the countries to the south of us. Look at what the pineapple did for Hawaii.

Saga of the Dutch Merchant Fleet

Now that the end of the war in Europe has lifted the strict secrecy on ship movements, the major part played by the Netherlands Merchant Marine in maintaining the allied lifeline to the various battle fronts has been revealed in a report released by the Netherlands Indies Government Information Service. The following are some of the salient contributions by the Dutch merchant fleet:

One of the main reasons that a German invasion of Britain never took place was the fact that the Dutch and Norwegian fleets had escaped seizure by the enemy. This left the Nazis with an insufficient number of vessels to carry through their proposed invasion.

When Java fell to the Japanese in March, 1942, there were 140 Dutch ships in Netherlands Indies ports. Eighty-three of these fell into enemy hands. The 57 ships that escaped were immediately placed at the disposal of the allied command, and before the United States merchant fleet could be fully organized for heavy duty to the Southwest Pacific, Dutch ships carried men, equipment and supplies to Milne Bay, Oro Bay, Lae and Port Moresby. That was during the bleak days of General MacArthur's earliest actions in New Guinea when the Japanese had advanced to within 32 miles of Port Moresby and enemy landings on the Australian continent were expected daily. Within thirty days after their arrival in Australia, Dutch ships carried 3000 American troops with full equipment and supplies to the battle zone; they ferried more than a million tons of war supplies to New Guinea before the end of 1943.

In addition to the 83 ships that fell into Japanese hands with the fall of Java, the Dutch merchant fleet lost half of her ships and crew members during the "Battle of the Atlantic." Dutch merchant ships were present at all allied landings; they carried troops and equipment to North Africa, Sicily and Normandy; they rendered valuable services in the invasion of Pacific islands. In the last few months they have transferred their activities to Borneo and Okinawa.

Although the American public knows little about the achievements of these Dutch ships, their deeds are well known along the waterfront in Australian ports, into which many of them limped with gaping holes in their sides. They were patched up and returned to sea duty with cargoes of munitions as soon as possible.

Shipping Men Taking Lead In Public Affairs

With John E. Cushing's election as a member of the Board of Trustees of Stanford University, San Francisco's shipping men are winning quite a reputation for the important part they are playing in civic and non-shipping affairs. Cushing is president of American Hawaiian Steamship Company, on leave to the War Shipping Administration.

Roger D. Lapham resigned as Chairman of the Board of American Hawaiian to become Mayor of San Francisco.

Henry F. Grady, President of American President Lines, is also president of the San Francisco Chamber of Commerce and Chairman of the Twelfth Federal Reserve Bank.

Lewis A. Lapham, Executive Director of the Pacific American Steamship Association, has just joined the list of shipping men among bank directors through his election as a director of the Crocker First National Bank.



John Eldridge Cushing.

John Cushing graduated from Stanford with the class of 1909. He is not the only shipping man on the Stanford Board, however. Almon E. Roth, president of the Federation of American Shipping has been a member since 1943, along with Herbert Hoover and many other notables.

ARE FINANCIAL RESOURCES ADEQUATE?

(Continued from page 406)

may be assumed that the post-war period will not alter this picture materially. It is likely, however, that during the period between the end of the war in Europe and the end of the war in the Pacific, the imports will rise in greater proportion to the exports, particularly the imports from Europe. While conditions after this war will be in many respects far different from the conditions after World War I, it is nevertheless significant that after World War I, overseas exports from Europe in the first two post-war years reached $5 billion out of which $800 million were exported to the United States. Exports under lend-lease in this transition period after the end of the war in Europe are estimated to be less than ½ of the present level of $11 billion for the year 1944.

It is but logical to assume that the dollar exchange that will be supplied by these large imports in addition to the enormous dollar and gold resources of which they already dispose, our exports, particularly durable goods, will continue unusually large over a considerable time in the after-war period.

For the distant future, however, the United States will have to assume its new role as the greatest creditor nation of the world by embarking on a comprehensive sponsorship of the agricultural and industrial development of the many deserving nations throughout the world by means of foreign loans and investments. Such a policy seems particularly well-advised if this country expects to sustain its great industrial capacity as actually used in this war and thereby keep its factories employed and the standard of living on a high level. The notion in this country that exports supported by foreign loans and investments should be resorted to as a temporary measure only is erroneous, and has its explanation in the procedure followed after World War I, whereby we chose to finance our foreign trade principally by means of short term loans which were called with disastrous results when the world depression took place in the 30's. This type of financing, in the light of past experience, appears particularly inappropriate and should be supplanted by the appropriation of long term loans or preferably venture capital. In this connection the figures recently presented by Dr. August Maffry of the International Economics and Statistics Unit, Bureau of Foreign and Domestic Commerce, Washington, D. C., with respect to our foreign loans and investments in the post-war period after World War I are revealing. Contrary to the general belief that investments of the United States made since the last war were almost entirely lost, there was recorded a substantial net return of $10.3 billion out of these investments by the end of 1940. This result was achieved despite the great depression that took place in the 30's.

The process of industrialization of a country and the consequent rise of the standard of living of its nationals has no specific ceiling at any time and consequently foreign investments made in that country may well continue indefinitely on a revolving basis to the benefit of both the creditor and debtor nations. Such operations, of course, presuppose stable political and economic conditions in the countries involved. Indeed it may well be anticipated that after the untold sufferings wreaked upon humanity in this Second War, we may look forward to a long period of peace and eventual economic stability.

If a constructive, well-directed foreign investment policy should be adopted by the United States, our country may well occupy, in the course of time, the pre-eminent position that Great Britain occupied in the latter part of the 19th Century and the beginning of the 20th Century, which position, occupied with signal success, exercised a powerful influence in the direction of peace and stability that the world enjoyed in that era.

Russia

Since Russia is also destined to occupy a prominent position in the post-war period as one of the "Big Three" countries, a word may be said about her economy with regard to its relation to the rest of the world.

It is estimated that prior to World War II Russia boasted a gold stock of at least $2 billion. The annual

production of gold in that country has since proceeded at the rate of some $200 million per annum, so that at present Russia may well have gold resources in excess of $3 billion, a tidy sum indeed, but by no means sufficient to provide for the post-war reconstruction and continued industrialization requirements of the country.

It must be remembered that the Russian system of foreign trade in the pre-war period was an all-inclusive government monopoly and is likely to continue substantially on the same basis in the post-war period. Under this system the Russian imports were arranged in foreign currencies as the internal and external values of the Russian currency had been completely divorced. While the principal foreign nations with free enterprise systems granted the Russians the "most favored nation clause" in their respective trade agreements with Russia, the latter under its State monopoly could, of course, regulate its own imports according to the State's requirements as a whole, regardless of the operation of the Russian tariffs. As a result, the advantage that Russia received under the most favored nation clause had to be offset by some other advantage conceded by Russia in return. This concession took the form of a quantitative stipulation up to which Russia agreed to import goods under the specific trade agreements from its trading partners.

Several trade agreements along these lines were completed in the pre-war period and they had the effect of channeling the entire trade with Russia into bilateral operations with special emphasis on bargaining positions that frequently had political implications. It will be readily seen if similar procedures should be adopted by Russia in the post-war period with its foreign trade partners, which will likely be manyfold that of the pre-war time, an enormous pressure will be ever present against the free enterprise systems of multilateral trade and most favored nation principles. A possible solution may be found through the allotment of Russian purchase contracts to a number of countries on the basis of free bargaining privileges as to price and credit terms.

"Are Financial Resources Adequate For Post-War World Trade?"

The answer, you will no doubt agree with me, should be decidedly in the affirmative. We have, however, seen that the distribution of these resources has undergone important changes, and while in normal time a policy of "laissez faire" may perhaps be the best one to allow the free play of the economic forces under a free enterprise system, under the present conditions, however, with the United States saddled with the great responsibilities that will face a disrupted post-war world, the U. S. Government should give direction to a well considered international policy by embracing such fundamental issues as freedom of international trade, reduction of tariffs under the reciprocal trade agreements program, sanctity of international trade agreements, and the resumption by free enterprise of all international activities that had to be temporarily placed under Government control due to wartime conditions.

Assuming that the moral leadership of the "Big Three" will be sufficiently strong to give the world assurance of a lasting peace and return of stable political and economic conditions, the latent financial resources and recuperative powers throughout the world will be ample to insure a sustained period of record world trade and prosperity.

Pacific WORLD TRADE

A Smudge on the Post-war Picture

By W. C. White
Vice President Alcoa S. S. Co.

I have only one fear about all the activity that our inquiries indicate and that is expressed in a letter which I recently received from our Chicago representative. I want to read you one paragraph of it:

"Recent conversations with export managers in this territory have indicated that some of them are looking to the period immediately following the termination of this war with increasing pessimism. Many feel that their companies will, for the first two years following the conclusion of the war, find the demand for their products so great domestically that they will not wish to entertain sizeable foreign orders. The period elapsing between the time that manufacturing is resumed and domestic markets have reached a saturation point will probably be sufficient to allow many European houses to retool. These houses, which have for years been completely dependent on foreign markets for their survival, will undoubtedly reach a decision in the reverse of that of the American manufacturers. That is to say, the European houses will undoubtedly see fit to take care of foreign markets first and domestic markets later. By the time the American manufacturer awakens to the export trade, he will find that not only will foreign competition be well established but that he will suffer the added disadvantage of having created a bad impression on the prospective importers due to his initial neglect or lack of interest in their requirements."

In striving for maximum production in this country, you and the other sales executives in America face the greatest challenge ever thrown down before you—and when I say that I do not forget the problems you faced and the job you did in 1930, 1931, and 1932.

Unless you broaden your market horizons to include the world, and sell that conception to your asciates so that not even the tremendous demand from your fellow citizens will keep you from establishing yourself in foreign markets, **you will be selling America's rightful heritage down the river to other more progressive and worldly intelligent nations.**

After two years living with the steamship industry — studying the possibilities of export trade day and night—I only regret that I cannot put this case before you more forcefully—for upon your decisions about export markets rests the future of the American Merchant Marine. The whole country wishes today that we had had a much larger merchant marine when war broke out, and hopes that having achieved it, we will be able to maintain it after the war. The answer lies to a great extent in what you and your associates do. If you tackle the markets of the world, as you always have domestic markets, nothing can stop you. There will be more production, and more jobs in this country and a greater American fleet on the seas.



Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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The Gyro-Compass

Part VIII. Equipment Operation

Preparing to Start

It is preferable to start the equipment at least six hours before the compass is required for service. This is to allow sufficient time for it to come up to running temperature and settle on the meridian.

Make certain that all supply switches are open.

Unlock binnacle top cover, open one door and make sure that vertical ring and rotor-case locks are applied.

Take hold of both sides of phantom and vertical rings and turn them slowly until compass card indicates approximate heading of ship. The compass should never be turned in azimuth, with the power off, by pressure on compensator weights or mercury ballistic.

Check height of oil in oil-well windows. Make sure that oil level is just even with center of dot on window and that oil level is the same on both sides of compass.

Test alarm by throwing switch on alarm unit for a second or so, to make sure relay functions.

Adjust speed and latitude correctors to proper setting.

Starting the Master Compass

Pull out circuit breaker plunger on control panel to energize motor-generator. Hold plunger out by hand until motor-generator speeds up (in about 5 seconds).

If compass rotor does not start with motor-generator, rock compass in plane of its rotor until it starts.

When starting alongside a dock, wait until rotor is up to speed (approximately 15 minutes), then turn on follow-up switch on amplifier panel. (When starting up at sea, release the rotor case and vertical ring locking latches immediately and steady the rotor case by hand until rotor is up to speed.)

Wait one minute for rectifier tube filaments to heat up.

Release rotor case and vertical ring locking latches.

Turn ON azimuth motor switch at amplifier panel.

Turn ON repeater switch at control panel.

Turn switch at alarm unit so as to silence alarm.

Reset compass on ship's heading by pressing down on one or the other of the rotor-case bearing housings, and if necessary level the rotor by pressing against the vertical ring until bubble is in normal settled position. Check repeaters, and synchronize if necessary.

When the rotor-case is unlocked the bubble should be brought to its settling position. The compass will then settle on the meridian without further assistance from the operator. The settling time may be greatly reduced, however, by setting the compass on the approximate heading before starting.

Setting Compass on Meridian When Ship's Heading is Known

After compass is up to speed and operating normally, precess compass by pressing on top of the proper rotor-case bearing housing until the compass card indicates the heading of the ship. Then level the case by bringing bubble to normal settled position. The compass is now within a degree or two of the meridian and will settle on the meridian rapidly.

Setting Compass on Meridian When Direction of North is Unknown

(1) Set the speed and latitude correctors. This can be done while the compass is coming up to speed.

(2) As soon as the compass is up to speed (about fifteen minutes after it is started) release rotor case and vertical ring locking latches.

(3) Level the rotor-case by pressing against the side of the vertical ring. If normal settling position of the bubble in the spirit level is known, bring bubble to this point rather than the center of the level.

(4) Note number of divisions bubble moves in one minute. Number of divisions multiplied by 10 equals approximate displacement in degrees from North.

(5) Apply downward pressure on rotor bearing housing away from which bubble moved until compass is precessed number of degrees computed.

(6) Level rotor-case again and repeat this operation. The compass will then be within a degree or two of the meridian.

(7) If the compass happens to be 180 degrees away from North, the second check will indicate a greater correction than the first. If this happens, run a third check, and if the bubble travel is greater than it was in the second you will know that the compass was started approximately 180 degrees away from North. Precess the compass 150 degrees in the same direction as the previous corrections and make two additional checks, which should bring the compass approximately on the meridian.

(8) An hour later note the position of the bubble and record for

future reference as the settling point for that particular latitude. The compass can be set on the meridian more accurately by starting the bubble from this point than by starting it from the center of the level.

(Note: As explained under "Operating Principles," the axle of the gyro-compass is horizontal only at the equator. As the compass is moved away from the equator, the vertical component of the earth's rotation begins to take effect. In northern latitudes the North end of the gyro tends to rise and turn to the East.

Therefore it must be precessed faster toward the West as the latitude increases. This is accomplished automatically by a slight tilt of the rotor-case and ballistic, which causes a greater amount of mercury to accumulate in the South mercury containers than in the North. The amount of tilt increases with the latitude, the bubble travel being in the direction the ship is moving, North or South. The bubble travel is approximately one division on the level for each 20 degrees of latitude change.)

Setting the Speed Corrector

When the compass is in operation, the corrector should be set for the approximate speed and latitude of the ship. These settings need not be changed for small variations in speed and latitude, but should be kept within 3 knots and 3° respectively.

To set corrector, turn knob until the scale line corresponding to the ship's latitude on the movable latitude bar intersects the curve representing the ship's speed on the speed plate across which the latitude bar is movable.

Setting the Latitude Corrector

To set the latitude corrector, turn knob until line engraved on lubber ring coincides with approximate local latitude marked on adjustable block of corrector.

If Alarm Sounds During Normal Compass Operation

A momentary failure of the supply current will cause buzzer to sound until the supply is restored, and in such case the accuracy of the compass will not be affected. It is well, however, to check repeaters with master compass after any momentary failure of the supply.

If alarm continues to sound, the current failure evidently is more than temporary. Turn switch OFF to silence buzzer. Examine control panel immediately. The circuit breaker is adjusted to open approximately 5 seconds after ship's supply fails.

If, on examination, the circuit breaker is found open, repeat instructions for starting compass at sea. Check master compass and repeaters.

Stopping Compass

Turn alarm switch to silence buzzer.

Turn OFF azimuth motor switch.

Turn OFF follow-up switch.

Turn OFF repeater switch.

Depress push-button on control panel until circuit breaker snaps open; the voltmeter pointer will then return to 0.

If stopping compass at sea, during heavy weather when considerable motion is imparted to the compass, steady rotor by hand until it stops, then lock it with locking latches. If stopping at dock, there is no need of supporting rotor by hand; it may be locked immediately.

Inspect equipment and clean same, if convenient. The equipment can be best cleaned while it is still warm.

Whether the compass should be stopped at the completion of a voyage depends upon how long the vessel is expected to remain in port. If the time in port is only a matter of hours, it is often expedient to leave the compass running. If it is a matter of days, it is better to shut the compass down. On the Great Lakes, where cargoes may be loaded or discharged in three or four hours, gyro-compasses are sometimes kept running during the full navigation season of six or seven months without a shut-down.

Notes:

Under normal operation, the rotor case is uncomfortably hot to the bare hand. This should occasion no alarm, as the normal operating temperature is approximately 45° C. (113° F.) higher than room temperature. Keep oil level even with center of dot in oil-well windows at each end of rotor case.

When setting the compass on the meridian be very careful not to disarrange the three-phase supply leads to the gyro. These leads are loosely coiled where they pass between the vertical ring and the rotor case. Any interference with their position will affect the settling position of the compass.

Never attempt to set the compass on the meridian by pushing on the compass card. The proper way to do it when the compass is not running is to grasp the phantom and vertical ring together and turn the compass until the card indicates the heading of the ship. When the compass is running, it should be precessed to the exact heading by pressing down on one or the other of the rotor-case bearing housings, and leveled by pressing against the vertical ring until the bubble in the spirit level is in its normal settled position.

Keep binnacle doors closed and cover locked whenever the compass is left unattended. ALLOW NO UNAUTHORIZED PERSON TO TAMPER WITH IT AT ANY TIME.

Setting the Repeaters

Harm is done by turning the repeater synchronizer knob when the repeaters are energized. The torque of the motor makes turning difficult, and for this reason it is recommended that all of the repeaters be synchronized as closely as possible with the master compass before the repeater switch is closed. The telephone set or voice tube between the wheelhouse and the master compass is used as an aid in obtaining accurate synchronization of the repeaters and the course recorder with the master.

As a rule, the manufacturers of radio direction finders provide an extension to the setting shaft so that the direction-finder repeater may be set conveniently from the outside. Otherwise it is necessary to open the direction-finder binnacle and reach inside to turn the synchronizing knob on the side of the repeater.

When synchronizing the course recorder, turn the synchronizing stem on the end of the motor shaft. To save time, close course recorder cover momentarily and note position of indicator dial relative to heading desired.

Then turn stem to bring indicator dial to heading by shortest route. With left-hand pen (zone pen) in proper quadrant, right-hand pen (course pen) can be brought quickly to the required course line on the chart.

CAUTION: Never attempt to synchronize the pens in any other manner than by the synchronizing stem. Application of force to the

cam drum, the indicator dial or the pen arms will only result in damage to the instrument.

Keep the course recorder closed and locked except when starting, stopping or making notes on the chart.

Gyro-Pilot Operation

Condensed instructions for the use of the particular type of Gyro-Pilot installed are contained on a framed chart in the wheelhouse. The instructions which follow apply specifically to the type of two-unit Gyro-Pilot now being manufactured.

As heretofore mentioned, the Two-Unit Gyro-Pilot provides for steering control by means of (a) the wheel on the steering stand, and (b) automatic follow-up action in conjunction with the Master Gyro-Compass.

Wheel Steering (Follow-Up Control)

Put the control lever on the steering stand at OFF.

At the motor control panel throw the D-C ship's supply switch ON.

Center the wheel pointer.

If the ship has a telemotor, open the bridge by-pass valve to allow the oil to circulate freely through the pipes.

Shift the control lever on the steering stand to HAND.

Steer by means of the gyro-pilot wheel.

Automatic Steering

Steady ship on course with the wheel, as in the preceding directions.

Put rudder amidship.

Move control lever to GYRO.

Set weather and rudder adjustments on Gyro-Pilot to meet sea conditions. (These are seldom altered after their best position is determined.)

To alter course less than 10°, turn pilot wheel in desired direction and steady ship on new course. Put rudder amidship and return control lever to GYRO.

Telemotor Steering

If it is desired to steer by means of the ship's telemotor system, move the control lever on the gyro-pilot steering stand to OFF, thus disengaging the magnetic clutch in the steering engine room, and close the by-pass valve to the telemotor.

Trick Wheel Steering

Provision is made for emergency steering at the trick wheel in the steering engine room. This is done by pulling the pin connecting the Sperry power unit to the engine valve and inserting the same pin in the trick wheel linkage.

Adjustments

The purpose of the weather and rudder adjustments is described fully in the previous section on the Gyro-Pilot; in general, remember that changing conditions at sea necessitate alterations in the steering characteristics of the Gyro-Pilot just as a human helmsman must vary the amount of rudder used to meet changes in wind and weather. Such changes are met by manipulation of the weather knob and the rudder knob.

Weather Adjustment

In good weather, set knob at 0. In a quartering sea, advance knob just enough to prevent rudder from running back and forth at every roll of the ship.

Rudder Adjustment

With ship light, set knob between 0 and 1. With ship loaded set between 1 and 3. These values are only indicative; experience will determine proper settings under different conditions.

Abnormal Operation

Excessive Compass "Hunt"

If master compass is "hunting" excessively, causing the automatic steering system to operate continuously, reduce the "hunt" at the master compass by turning the lost motion adjusting knob on the compass transmitter.

The most accurate steering is obtained when the lost motion hammer of the compass transmitter just strikes the stop at each stroke, without causing the roller brushes to move unless there is movement of the ship's head.

Falling Off Course

A sharp change in wind direction or strength will sometimes cause the ship to fall off slightly one or two degrees from the set course. In this event, turn pilot-wheel slightly to compensate for the changed conditions.

BOOK REVIEWS

George W. Codrington, general manager, Cleveland Diesel Engine Division, General Motors Corporation, Cleveland, Ohio, has just published a book dealing with the history and present-day application of diesel-electric drive. The book carries the title "Diesel-Electric Drive in Marine Service," and is a beautiful piece of work. In 104 pages of text and attractive illustrations, it deals frankly with a subject which continues, month by month, to increase its appeal to naval architects, shipbuilders and vessel owners. This publication will undoubtedly be given an enthusiastic reception in all branches of the marine industry.

Particularly instructive are the sections devoted to flexibility and torque characteristics, direct and alternating current drive, maneuverability, weight and space conservation. In addition, there is a most interesting chapter on the evolution of ship propulsion and a number of modern engine room layouts. Individuals and companies may secure a copy of the book from Mr. Codrington.

Soybean Chemistry and Technology, by Klare S. Markley and Warren H. Goss (Chemical Publishing Company, Inc. $3.50). The authors have presented a timely book covering the technical and chemical aspects of the soybean. The text comprises a valuable digest of numerous research contributions and references that have appeared up to 1943 in technical literature throughout the world. This book fills an important gap in technical libraries. Any one interested will find it a valuable source of factual information.

Centrifugal Pumps and Blowers, by Austin H. Church (John Wiley & Sons, Inc. $4.50). The author, associate professor of machine design at New York University, has prepared a fine and scholarly book on the application and use of centrifugal pumps and blowers. It contains illustrations, charts and mathematical equations and is especially slanted towards the problems that face the young graduate engineer engaged in the design of centrifugal fluid movers.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

QUESTIONS FROM THE SHIPS

Question:

"A few years ago you ran an article in your column on engine balancing and stated that anyone who desired would be sent a procedure for a running balance on a turbine engine. Would you be so kind as to send me a copy?"

Answer:

Literature on the instruments used for balancing at speed in place is being mailed. However, this is probably not available to the men on board ship.

The process of balancing is discussed in 6-72, Vol. III, "Marine Electrician's Library," McGraw-Hill Book Co., which is available in most libraries and technical book shops. This covers static balance, dynamic balance, balancing in place, and in the shop.

Commutation and Brushes

(Continued)

Commutation Factors

Firm contact between the brush and the commutator as being a prime requisite was discussed in the May issue. The nature of the commutator film, atmospheric conditions, friction characteristics of the brushes, brush pressure and angle of inclination all have an influence on the intimacy of brush contact.

Another property considered more important than all of the above-mentioned factors is the **elastic property** of the brush. This property can be accurately determined, and because of its direct influence on the successful performance of commutators and brushes it has been given the specific name of **commutation factor.** Years of careful observation under controlled conditions have demonstrated the importance of this property of brushes.

By selecting carbon and graphite materials, and by controlling the manufacturing technique, the commutation factor may be made an optimum value, insuring the best possible contact being maintained between the brush and commutator, in spite of many of the unfavorable conditions which ordinarily would disturb this contact.

Contact Drop

Most experienced marine electricians and brush manufacturers have felt that contact drop is the measure of the commutating properties of a brush. This is the voltage measured with a low reading d-c volt meter, perhaps (0 to 15) volts, with one terminal connected to the brush and one to a pencil lead which slides on the commutator alongside of the bush. It usually will be less than 3 volts at full load on the machine. This valve should not go to zero and reverse as the pencil is moved along the commutator from leading to trailing edge of the brush. If it does not go to zero or reverse there is no short circuit current flowing from one bar to an adjacent bar, through the brush, while both bars are under it. The small voltage in the coil shorted by the brush may tend to crowd more current toward one side of the brush, overloading the area there and underloading the area near the other side.

In the case of over or under compensation, i. e., commutating field strength, the contact drop may reverse and current is flowing in the short circuit formed by the brush.

The conventional method of illustrating the commutation of the current in an armature coil is shown in Fig. 1. Fig. 2A is a normal curve of commutation current. The vertical axis of this graph represents the valve and direction of current in coil "a" Fig. 1 during the commutating interval, and the horizontal axis is the position of the mica insulation between segments "A" and "Z." The current flowing through commutator segment or bar "A" as it passes under the brush is indicated by the horizontal lines in Fig. 2B. The horizontal location of these lines shows the successive positions of segment "A" in relation to the brush face, and the vertical length of these lines shows the valve of the current flowing through the segment at the position indicated.

The corresponding range of current density, amperes per unit area of brush face, at the several points across the brush face is shown at Fig. 2C. The full cycle of variation between maximum and minimum limits of current density at any point on the brush face has a frequency equal to that at which the commutator bars are passing that point.

The value of current density here represented assumes contact with the brush over the full surface area of that portion of the bar under the brush at any given time.

No attempt will be made here to evaluate the very much higher current densities encountered momentarily at the relatively small number points at which contact actually occurs.

Exact performance according to a particular set of curves such as Fig. 2 will occur in adjacent coils and bars if the armature is in electrical and mechanical balance and has only one coil per slot. Where there is more than one coil per slot, the second coil will commutate under slight-

ly different field conditions than the first, and the third different from the second, and so on. Therefore between segments (bars) in which essentially identical conditions recur, there will be one or more intervening segments in which the cycle of commutation is somewhat different. This is the reason for second and third bar marking sometimes observed on the commutators of machines having two or three coils per slot and commutating under marginal conditions.

Figure 3A is typical of the commutation curve found under conditions of over compensation (commuting field too strong). It will be noted from Fig. 3B and 3C that reversal of current occurs in the bars shortly before passing out from under the brush, with corresponding reversal of current in that portion of the brush face. Under such conditions intermittent short circuit current flows in the brush face near the trailing edge and the contact drop shows reversal near the trailing edge.

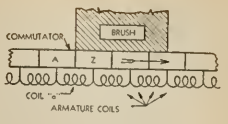
With under compensation (commutating field too weak) similar effects are to be found near the leading edge of the brush. If the armature has three coils per slot it is entirely possible for one coil to be under compensated during commutation, the next to be properly compensated and the third over compensated.

It will also be noticed from these figures that the highest current density in the brush face is at the same point as the most rapid change of current in the coil undergoing commutation. It should be noted that the coil process of commutation for a given coil is the period of reversal of current in it, as shown at "A," Figs. 2 and 3. These facts, together with the increase in contact drop which accompanies this rapid change of current, may cause serious sparking even when, as in Fig. 3, this condition is encountered at a point underneath the brush and is not visible. The higher the rate of change of current the higher the inductance voltage in the coil, which appears across the two adjacent bars. The extremely wide range of fluctuation in local point current density indicated near the central part of the brush face in Fig. 3C may also be a source of concealed or invisible sparking and brush face and bar marking.

It must not be assumed from this discussion that contact drop is entirely valueless as a measure of brush performance. Some contact drop, or in other words contact resistance, is needed to assist the impedence of the coil in limiting the short circuit current bar to bar via the brush face under conditions of imperfect compensations, or commutating field strength. Reasonable contact resistance probably tends to improve the commutating cycle, preventing too rapid transfer of current from a segment already under the brush to one just making contact at the leading edge, and also helping force current from a segment, about to break contact at the trailing edge, into those still making full contact. Where uniform surface conditions are maintained on the commutator and the contact resistance of all the brushes of like polarity is essentially the same, the fact that contact resistance constitutes the principal resistance in the several paths in parallel tends to stabilize the current distribution between brushes and minimize selective action. This later condition is the case of one or a few brushes taking more than their share of the total load current.

It is difficult to set forth what is the most important property of a carbon brush. The characteristic which makes a brush the ideal selection for one application may be of secondary importance to some other property on another machine. For heavy duty service it is likely that those characteristics which aid or permit the development and maintenance of a uniform surface film on the commutator are of greatest importance. The relative importance of individual characteristics for any particular application depends upon the unfavorable or disturbing factors which must be overcome. From the large number of such factors and the varying influence each may have on different applications it is understandable why the "one" universal brush for all jobs has not yet been found, and why there is such a variety of brushes to be found on different machines and even on duplicate machines.

Methods of taking contact drop and its interpretation will follow in succeeding issues.



CONVENTIONAL DIAGRAM ILLUSTRATING COMMUTATION INTERVAL

Fig. 1

Fig. 2

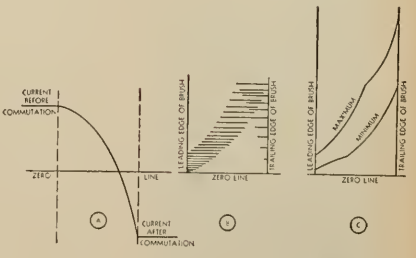
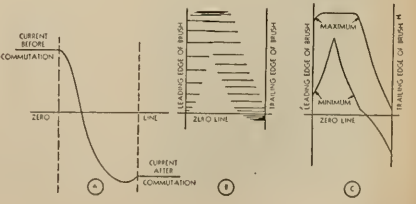


Fig. 3



Keep Posted

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Splash-Proof Inverter

A splash-proof inverter has just been announced by Electrical Engineering and Mfg. Corp., Los Angeles, California. Particularly suited to marine conditions, this compact unit will convert 32-volt D.C. current into 110-volt 60-cycle A.C. current. As furnished now to the U. S. Government, this totally enclosed, fan-cooled model is of 350-volt amperes capacity, continuous duty type, with 900-volt amperes peak capacity. It could be adapted for use with a power supply source of 110-volt D. C., and would be particularly useful on boats having D.C. power supply yet requiring a small amount of alternating current for the operation of standard commercial electrical appliances without necessitating the purchase of special equipment.



Changing Heavy Dies by Electric Truck

Dies weighing 10 to 20 tons or more as used by builders of aircraft, motors and armament require frequent removal and replacing on presses. The problem of handling these large, cumbersome loads quickly, safely and economically is solved by The Elwell-Parker Electric Co.'s modern die-handling truck.

In handling dies on this truck the driver pulls up to the press bed and elevates the platform to the height of the bed. He then reels off wire cable, on both sides of the truck, passes each length through a pulley on the end of the platform, and hooks it to the rear side of the die. When the cable is wound on the drum the die slides off the truck onto the press. In removing the die from the press the cable hooks are attached to the far side of the die and it is pulled forward from the press onto the platform. One man only, the driver if necessary, can change dies, once the die is unbolted from the press.

This method of handling is finding extensive application in forging departments doing a wide range of work, because of the ease and safety of the operation. The truck conserves man power, avoids tying up expensive presses while changing dies manually, and thus speeds production.

Rereeving a New Wire Rope

When replacing an old and worn rope with a new one, on any machine which requires pulling the new rope through blocks, over sheaves and onto drums, here is an idea that will save not only time and temper but money and profanity.

From the end of the old rope, unlay and remove four of the six strands to a distance of about two or three feet. Similarly remove two of the six strands from the new rope to be installed.

Splice, or more properly speaking "lay," the two together and tape the ends to prevent unraveling. This will permit the new cable to be pulled through blocks and pulleys and reeved rapidly, accurately and easily.

This, of course, can be done only with preformed wire rope, since it is only that type of wire rope with strands which will lie inert. To remove the seizing wires and attempt this procedure with non-preformed wire rope would be courting disaster, since ordinary wire rope, so cut, would virtually explode.

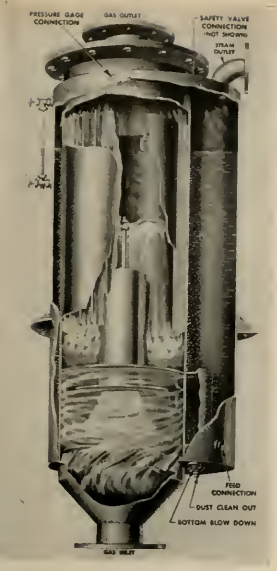
A Clever Clevis

A new clevis ring has been introduced by Poulsen & Nardon, Inc., Los Angeles manufacturer of stamped parts and fittings.

Utilizing their great experience in stampings, company engineers devised a clevis ring that can be produced in a simple stamping operation. It is made to exacting dimensions from alloy steel, carefully formed to retain the full strength qualities of the steel. Each ring is cadmium plated, and conforms to specifications ANQQ-P-421.

Tests have shown that the strength factor of this clevis ring is in excess of the cable with which it is used. It fits any standard cable terminal.





A Heat Recovery Silencer for Diesels

Although exhaust heat recovery is an old story by now, continued improvement in devices used for this purpose is a matter that should be followed with considerable interest by everyone concerned with power plant operation where steam or hot water is in demand.

The latest to come to our attention is the new Vortex Heat Recovery Silencer for diesel engines developed by the Engineering Specialties Co., Inc., New York, which the manufacturers believe is one of the most efficient units of its kind produced to date.

Designed for both marine and stationary installations, this silencer combines four functions in one construction: steam generation up to 30 lb. psi depending upon the service, water heating, exhaust silencing and the removal of sparks and carbon from exhaust gases. Yet it normally occupies little more space than spark arrester-silencers without the steam or hot water features.

It produces an exceptionally high ratio of steaming rate to engine horsepower due to its exclusive design and unique construction which holds the rate consistently high for most operating conditions.

Operators of diesel engines will find many uses for this waste heat silencer. The steam can be used for space heating, processing and other services. And the unit is equally useful when functioning as a hot water boiler. Furthermore, in many instances it will serve as an auxiliary to separately-fired steam generators and hot water boilers or as an adjunct to carry peak loads.

Installation of the Vortex Heat Recovery Silencer is simple and in no way detracts from engine efficiency. In fact, engine economy is often improved because of the low back pressure design of this unit.

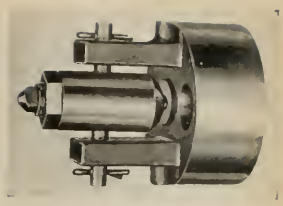
The Bearing Watchdog

Paxton Diesel Engineering Company of Omaha, Nebraska, offers a new, thoroughly tested and approved automatic device to detect the wear or shell-out of the connecting-rod and main bearings of a diesel engine. It has been thoroughly tested on leading railroads and affords inexpensive insurance against expensive crankshaft replacements and repairs.

This device consists of a "Watchdog" or trip-lever installed in the crankcase under each connecting-rod throw, a lug for each connecting-rod bearing cap, a dump-valve to be attached to the Serv-O-Motor of any standard hydraulic governor, a control box containing an air pressure reducing valve and tell-tale light, and copper tubing for connecting the various parts.

The Bearing Watchdog system is connected to the main air supply and under normal conditions a constant air pressure of ten pounds is maintained throughout the Watchdog system. In the event a connecting-rod bearing or main bearing wears excessively or shells-out, the bearing cap lug strikes the Watchdog trip lever. This causes the release of the air pressure from the Watchdog system, which actuates the dump-valve on the governor and effects an immediate shutdown of the engine and simultaneous lighting of the tell-tale light. The clearance between the Watchdog trip lever and the lug on the connecting-rod bearing cap is set to represent the maximum amount of wear permissible (usually about .012 of an inch).

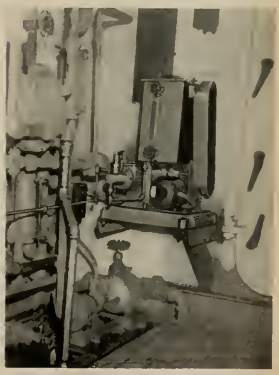
The Watchdog system also will shut down the engine if a main bearing goes out, because the crankshaft



will flex sufficiently to trip the Watchdog. It also protects the engine in case of broken bearing caps, cap bolts or connecting-rods, as anything that releases the air pressure from the Watchdog system causes an almost instantaneous engine shutdown.

New Proportioning Pump

% Proportioneers, Inc.%, Providence, R. I., well-known manufacturer of chemical proportioning equipment, has just announced a new package-type proportioning pump to add colloid and phosphate for maintaining maximum heat transfer in marine evaporators by keeping tubes free from incrustation. This unit includes a spill-proof solution tank, sight glass, cover and motor-driven agitator. The chemical feeder, a %Proportioneers% Midget Adjust-O-Feeder with fluid sealed plunger and stuffing gland, assures extremely long life and satisfactory performance when handling any chemical. A unique arrangement is employed for driving the agitator and pump with a single motor. All parts are readily interchangeable for ease of maintenance.



On the Ways—

SHIPS IN THE MAKING



LIGHT FOR THE WOUNDED

No mistake could be made about the identity of this hospital ship, the Haven, recently completed at the Todd Shipyards Corporation's Brooklyn division. This is how all hospital ships travel at night—so brilliantly lighted that Jap pilots don't even have to come close to tell what she is.

L. D. Smith Shipyard Launches Cargo Ship

When the Navy cargo ship M. S. Tulare, 83rd ship to be launched since 1941 by the Leathem D. Smith Shipyard, Sturgeon Bay, Wisconsin, recently slid down the ways, the California county after which it was named was well represented in "spirit" and in person. The ship was christened with a special bottle of champagne produced in the county, and the ceremony was attended by a native daughter of Tulare, comely Nancy Jean McMillan, University of Wisconsin coed.

The launching was a double one, with the Navy Tanker YW 126 going in at the same time.

The Leathem D. Smith yard, at the start of its program in 1941, employed only 50 men, but has grown at a phenomenal rate until it now employs 5000 men and women, completing contracts for more than 100 ships of eight different types, valued at 140 million dollars. Production facilities have been developed to build five different types of ships simultaneously. The company has a Maritime Commission "M" flag with two stars, and is one of the few shipyards in the country to have both Army and Navy "E" awards, which have been renewed three times.

Navy Awards Hunters Point Contract

Contract for the sub-surface boring for foundation studies on additional improvements at the Naval Drydocks, Hunters Point, San Francisco Bay, was awarded by the U. S. Navy to J. D. Proctor, Inc., general contractor of Point Richmond, California, according to a recent announcement.

J. D. Proctor, Inc., recently completed with a safety record, and with commendation from the U. S. Army Engineers, the hazardous underwater cleanup, including unexpended explosives, resulting from the Port Chicago explosion of July, 1944.

The sub-surface boring contract amounts to $77,365.

Concurrently, J. D. Proctor, president of the firm, has appointed W. Harcourt-Palmer, superintending engineer.

San Pedro Yard's Last Destroyer

USS Harwood, built by the Bethlehem Steel Company, San Pedro Shipbuilding Division, Terminal Island, was launched May 22. The sponsor for the new destroyer was Mrs. Bruce Lawrence Harwood, widow of Commander Bruce L. Harwood, USN, in whose honor the ship is named.

The vessel is the last of the 25 large destroyers built by Bethlehem Steel. They carry twin five-inch guns, anti-aircraft protection, torpedoes, and depth charges, and would have been classed as light cruisers in the first world war. The Bethlehem yard in San Pedro is still building small tugs, but repair facilities are being augmented and in the near future the entire plant will be devoted almost exclusively to repair work.

British Government Honored

The British Government was honored at the launching of the M. V. Hickory Cape, June 9, at Consolidated Steel Corporation's Wilmington shipyard. The M. V. Hickory Cape is one of a series of thirty vessels being built by Consolidated for the British Ministry of War.

Sponsor of the vessel was Mrs. Harry B. Livingston, wife of the British Consul General at Los Angeles. Before coming to Los Angeles three months ago, the Consul General and Mrs. Livingston were stationed for five years at Geneva, Switzerland. Mr. Livingston has been in the British diplomatic service for twenty-five years.

The M. V. Hickory Cape, which is classed as a C1-M-AV1 coastal cargo vessel, has a length of 326 ft., a beam of 50 ft., and a dead weight tonnage of 5,010. It is powered by diesel engines and has a cruising radius of 10,600 miles.

Top, right: The double launching party at Leathem D. Smith shipyard when the M. S. Tulare and YW 126, Navy tanker, were launched. Seated, l to r: Mrs. Leathem D. Smith; Mrs. Paul H. Townsend, sponsor of Tulare; Mrs. F. A. Flodin, sponsor of YW 126; Miss Nancy Jean McMillan. Standing, l to r: Leathem D. Smith; John M. Bush, Cleveland Cliffs Iron Co. of Negaunee, Mich.; F. A. Flodin, pres. of Lake Shore Engineering Co.; Paul H. Townsend, Huron Portland Cement Co.; Mrs. A. C. Rohn, and A. C. Rohn, chief engineer, U. S. Maritime Commission.

Center: USS Milwaukee was lend-leased to Soviet Union for operation with the Red Fleet as the cruiser Murmansk. Launched in March of 1921 at Tacoma yard of Todd's and commissioned in May, 1923, the 22 year old veteran's 35 knot speed makes her the fastest cruiser in the Russian fleet.

Bottom, left: Hail and farewell! This is the last view of its kind Western Pipe & Steel workers are likely to see for some time; the Sea Oriole about to leave her cradle.

At right: Mr. and Mrs. A. E. Wishon and Howard G. Tallerday, board chairman of Western Pipe and Steel Company. Mrs. A. E. Wishon was sponsor for the last ship to leave the company's ways.













Veteran of over 100 ship launchings, Joe O'Boyle, Sturgeon Bay, poses for the cameraman, while on a last-minute inspection of a ship about to be launched. This unusual photo shows the propeller of the 338-foot cargo vessel Westchester, at the Leathem D. Smith shipyard.

The launching party of the tuna clipper, Courageous, shown at left, just before she slid down the ways at United Concrete Pipe Company. Above, from left to right: Mr. and Mrs. Lewis L. Livesley and Mr. and Mrs. M. Luz. Mrs. M. Luz sponsored the Courageous.



(Photo from Wilmer C. Schroeder)

Safe Launchings On the Great Lakes

Eighty-eight ship launchings without an injury to the skilled crew of about 100 men upon whose shoulders rests one of the greatest responsibilities in shipbuilding. That is the remarkable safety record established by the Leathem D. Smith Shipbuilding Company.

Since this Great Lakes shipyard entered the present emergency program in 1940 it has successfully launched vessels of eight entirely different types, ranging from small ocean-going tugs to 338-foot cargo ships, and neither the ships nor the workers who scurry about beneath the huge hulls until seconds before they are launched, have suffered the slightest injury.

The responsibility of safely floating these vessels valued at millions of dollars is assigned to Joe O'Boyle of Sturgeon Bay, Wisconsin, veteran at the art of launching ships on the Great Lakes. O'Boyle has supervised the launching of more than 100 ships on the Lakes during the past 25 years in temperatures varying from 20° below zero to 110° above, and though he has experienced many exciting and difficult moments, he has never had a ship "go bad" on him.

Construction of All-Steel Tuna Clippers

The tuna clippers now in production at Long Beach shipyard of United Concrete Pipe Corporation are all-steel construction with the exception of wooden joiner work in the deckhouses and the hold insulation, which will be cork. The crew's quarters will be insulated with spun glass.

The vessels are incorporating the most modern but proven ideas, such items as unusually good ventilation, a fidley permitting plenty of light, air and an inside passageway from deck to engine room.

The principal dimensions of these single screw tuna clippers are:

Dimensions

Length over all	131′
Length on Load Water Line	125′ 3″
Length bet. Perpendiculars	119′ 9″
Beam Molded	27′
Depth Molded	14′ 5⅛″
Total Fish tons capacity	300 tons

Bethlehem Builds a Navy

The Bethlehem Steel Company's outstanding achievement in building 35 per cent of the world's greatest Navy in record time was excellently portrayed to more than five hundred of the Bay Area's business and industrial leaders, following a luncheon at the Palace Hotel in San Francisco on June 21st.

Introduced by Vice President Paul Mackall who gave a neat speech was A. B. Homer, vice president in charge of the shipbuilding activities of the company, who referred briefly to the colossal task involved by the demands of the U. S. Navy and the U. S. Maritime Commission, dealing with 30,000 firms supplying parts and materials, and reaching into communities in every part of the nation. They have operated 16 shipyards, located on both coasts, doing new construction and ship repairs, and have completed over 1000 ships of various types, including many of the largest and most difficult naval construction, and all to a specially exacting time schedule.

The sound film entitled "Shipways" was very cleverly produced and showed various scenes taken in the numerous Bethlehem shipyards throughout the country during the last three years. President Eugene Grace and several other officials of the company appeared in a few scenes in consultation with the workers in the plant.

The whole affair was managed with the same skill and efficiency which characterizes all Bethlehem undertakings and was the subject of very favorable comment from the guests present.

Some Pacific Coast Launchings From May 15 To June 15

Bethlehem Steel Company, San Pedro Yard, Terminal Island, Calif.

Destroyer, USS Harwood, launched May 22.

Bethlehem Steel Company, San Francisco Yard

Destroyer USS William C. Lawe, May 21.

California Shipbuilding Corporation, Terminal Island, Calif.

SS Winthrop Victory, May 17
SS Niagara Victory, May 19
SS Wayne Victory, May 28
SS Lane Victory, May 31
SS Kenyon Victory, June 5
SS Wabash Victory, June 9

Consolidated Steel Corporation, Wilmington, Calif.

MV Hickory Dale, May 17
MV Hickory Burn, May 24
1st all-steel tuna clipper, May 26
MV Hickory Bay, May 30
MV Hickory Coll, June 5
MS Long Splice, June 8
MV Hickory Cape, June 9

Kaiser Company, Inc., Yard Three, Richmond, Calif.

SS Marine Adder, May 16

Kaiser Cargo, Inc., Yard Four, Richmond, Calif.

MS Spindle Eye, May 25
MS Marlingspike Hitch, June 8

Marinship Corporation, Sausalito, Calif.

SS Huntington Hills, tanker, May 14
SS Coyote Hills, tanker, May 24

Permanente Metals Corporation, Yards One and Two Richmond, Calif.

SS Hobart Victory, Yard 1, May 25
SS Catawba Victory, Yard, 1, June 6
SS Hamilton Victory, Yard 1, June 16
SS Augustana Victory, Yard 2, May 16
SS Berry Victory, Yard 2, May 19
SS Drake Victory, Yard 2, May 23
SS Phillips Victory, Yard 2, May 26
SS New World Victory, Yard 2, May 30
SS Adelphi Victory, Yard 2, June 2
SS Drury Victory, Yard 2, June 6
SS Allegheny Victory, Yard 2, June 9
SS Earlham Victory, Yard 2, June 13

Western Pipe & Steel Co., San Francisco, Calif.

SS Sea Oriole, May 17, last ship of their contract.

Princess Pat, tuna clipper, almost afloat on marine railway at Consolidated Steel Corporation yard at Newport Harbor, California.

Mrs. George G. Sharp, wife of prominent New York naval architect who designs ships for Ingalls, recently christened the SS Sea Phoenix, all - welded war cargo vessel, at the Pascagoula, Mississippi, shipyard. In the launching party are, l to r: Dave C. Miller, George G. Sharp, G. B. Field, Ingalls public relations director, Mrs. Dave C. Miller, Jane Sharp, and Mrs. Sharp, and W. R. Guest, v. p. at the company.









Left: After the fire. The fire-gutted tanker, Spring Hill, as she looked when brought into Todd Shipyards Corporation's Brooklyn division after collision last February with tanker Pan Clio in Upper New York bay.
Right: After repairs. Virtually a new ship, the tanker is ready to leave the Brooklyn shipyard after extensive repairs, completed 40 days ahead of schedule, make good the damage caused by the collision and fire.

Burnt-Out Tanker Repaired

Back in service 40 days ahead of the time estimated for repairs, the 16,000 ton tanker Spring Hill, blasted and seared from stem to stern by exploding gasoline after a collision with another tanker in Upper New York Bay last February, left Todd Shipyards Corporation's Brooklyn division, virtually a new ship.

In the disaster, the second worst in New York harbor since the war began, 19 lives were lost and 122 crew members injured, and it was feared the Spring Hill would be a total loss.

At Todd, the fore and aft sections of the spar deck were completely rebuilt, all piping, valves and fittings were renewed, about 6000 feet of cable was installed and tested, and much of the ship's electrical equipment was replaced. Crew and officer quarters were extensively renovated. Exhaustive tests were made of the main engines, and necessary overhaul completed. The ship now has new rigging on the fore and main masts, new life rafts and floats. Six of her original lifeboats were rebuilt, the entire vessel painted inside and out, and her guns removed and sent to the Navy yard for repair before being re-installed.

At the time of the collision, the Government-owned Spring Hills was anchored about 1000 yards off Staten Island. She had 120,000 barrels of high-octane gasoline in her tanks, the greater part of which was saved, due to the successful use of fire-fighting foam, shot into the burning ship by city fireboats and Coast Guard vessels.



Top: The 50th vessel off the San Francisco ways of Bethlehem Steel Co., the USS William C. Lawe, destroyer. Left to right: Commadore Joseph Sendik, chief of convoy duty, U.S.S.R.; Vice Admiral C. E. L. Helfrich, commander in chief, Netherlands Forces, Far East; Vice Admiral J. W. Greenslade, USN (Ret.), resources co-ordinator, Western Sea Frontier, and Mrs. William C. Lawe, sponsor of the destroyer.



Left: M. S. Spindle Eye launching party at Kaiser Cargo, Inc., Richmond Shipyard No. 4, on May 25. Christening the vessel is Mrs. Edgar L. Buttner, wife of Oakland's leading marine electrical contractor; maid of honor, Miss Lena Decaminada; and flower girl, Miss Marianne Buttner.

50th Vessel Off Bethlehem's S. F. Ways

The USS William C. Lawe, 50th combat vessel to be launched by the San Francisco shipyard of Bethlehem Steel Company during World War II, slid down the ways on May 21 before the most distinguished group of international naval officials ever to witness a World War II Pacific Coast launching.

Foreign-power naval representatives present were: Vice Admiral C. E. L. Helfrich, commander in chief Netherlands Forces, Far East; Cap-

tain Holley Williams, Technical Adviser; Commodore Joseph Sendik, chief of convoy duty, United States, U. S. S. R.

The launching was a double observance of the 50th mark, commemorating the 50th anniversary of Naval service for the guest of honor, Vice Admiral J. W. Greenslade, USN (ret.) resources co-ordinator, Western Sea Frontier, and the 50th fighting vessel to be built by the local shipyard.

Breaking the champagne bottle on the prow of the super-destroyer was Mrs. Nancy Lee Lawe of Coronado, California, widow of William C. Lawe, Aviation Metalsmith 3rd Class, USN, for whom the vessel is named.

New Ship Program Starts At Todd New England Yard

Following the completion of the EC-2 Liberty ship program, the New England Shipbuilding Corporation, South Portland, Maine, affiliate of Todd Shipyards Corporation, is now fully devoting its large facilities to two new contracts for ship construction.

The first of the new contracts calls for the building of twelve ZEC-2's of the modified Liberty type, known as Airplane Cargo Carriers or "Zipper" ships. Keels for four of these already have been laid in the East Area basins of the yard.

Construction of twelve T-1 tankers which will be turned over to the British Government is provided for by the second contract.

May Ship Construction Record

Vice Admiral Howard L. Vickery, vice-chairman for the Maritime Construction and "spark plug" for the entire ship construction of merchant tonnage in this war under Vice Admiral E. S. Land, chairman, reported after his inspection tour of the West Coast in May-June, that the delivery of 112 ships of 1,120,584 tons during May brought the ship production for the first five months of 1945 to 586 ships of 5,948,735 d.w. tons.

Pacific Coast yards delivered 52 vessels, the East Coast 32, the Gulf 10 ships, and the Great Lakes delivered eight coast-cargo vessels.

Of the total, West Coast yards delivered 535,558 d.w. tons, or 47.6 per cent of the May production.

Ships delivered from the Nation's Maritime Commission shipyards during May follow:



Most recent photo of Vice Admiral Howard L. Vickery, vice-chairman of the U. S. Maritime Commission, taken during his May-June visit to the Pacific Coast shipyards. With him is Carl W. Flesher, West Coast regional director of construction for the Maritime Commission.

Shipyard	No. of Vessels	Type of Vessel
Alabama Dry Dock & Shipbuilding	3	T2 Tankers
Avondale Marine Ways	1	N3 Coastal Cargo
Bethlehem-Fairfield	10	Victory Cargo
Bethlehem-Sparrows Point	1	Private Tanker
California Shipbuilding	8	Victory Cargo
Consolidated Steel (Wilmington)	6	C1-M-AV1 Coastal Cargo
Consolidated Steel (Long Beach)	2	C1-M-AV1 Coastal Cargo
Delta Shipbuilding	4	Liberty Colliers
	1	Liberty Cargo
Froemming Bros.	1	C1-M-AV1 Coastal Cargo
Globe Shipbuilding	1	C1-M-AV1 Coastal Cargo
Gulf Shipbuilding	1	C-2 Cargo
	1	R2 Refrigerated Cargo
Ingalls Shipbuilding	1	C-3 Cargo
	1	Military Type
J. A. Jones Construction	1	Liberty Cargo (boxed plane carrier)
Kaiser, Richmond No. 4	3	C1-M-AV1 Coastal Cargo
Kaiser, Richmond No. 3	1	Military Type
Kaiser, Swan Island	3	T2 Tankers
Leathem D. Smith	1	C1-M-AV1 Coastal Cargo
Marinship	4	T2 Tankers
	1	T2 Naval Tanker
McCloskey & Co.	1	N3 Coastal Cargo
Moore Dry Dock Co.	2	C-2 Cargo
	2	R2 Refrigerated Cargo
North Carolina Shipbuilding	5	C2 Cargo
New England Shipbuilding	4	Liberty Cargo
Oregon Shipbuilding	8	Victory Cargo
Pennsylvania Shipyards	2	R1 Refrig. Coastal Cargo
	3	C1-M-AV1 Coastal Cargo
Permanente, No. 1	3	Victory Cargo
Permanente, No. 2	9	Victory Cargo
Pusey & Jones	1	C1 Cargo
Sun Shipbuilding	6	T2 Tankers
	1	C2 Cargo
Walter Butler (Superior)	3	C1-M-AV1 Coastal Cargo
Walter Butler (Duluth)	2	C1-M-AV1 Coastal Cargo
Walsh-Kaiser Co.	3	Military Type
Welding Shipyards, Inc.	1	T3 Tanker

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIV[illegible] [illegible]N
MARINE UNDERWRITE
200 BUSH STREET . . . . . [illegible]N FRANCISCO
Offices at: Colman Bldg., Seattle • 111 W[illegible] 7th St., [illegible] Angeles

Marine Exchange News

New Members

The roster of the Marine Exchange has been expanded with the acceptance of membership from the following:

Belfast Beverage Company
Captain E. K. Butzing
O. Casperson & Sons
Coast Marine Engineering Company
Emmco Electric Company
Engineering Services
General Refrigerator Corporation
Grove Regulator Company
Jensen Instrument Company
Kelite Industrial Cleaning Materials Company.
Luminous Materials Company
Mallott & Peterson
Marine Transport Lines
Marshall Newell Supply Company
Masters, Mates & Pilots of America, Local No. 90.
E. E. Myers (Travelers Check Dept., Bank of America)
National Lead Company
Nelsen & Jorgensen
Palace Hardware Company
Ray Oil Burner Company
L. D. Reeder Company
Republic Electric Company
Ryt-Oyl Lubricants Company
Stockton Ship Works
United Pipe & Supply Company
Vander Laan Piling & Lumber Company

Legislation

The Marine Exchange has supported Federal legislation to effect the Bretton Woods Agreements and the renewal and expansion of the authority under which reciprocal trade agreements are negotiated as embodied in the Doughton Bill.

These efforts are meeting with more than anticipated success.

Among State legislation supported were bills authorizing appointment of a full-time manager for the Port of San Francisco. Neil S. Laidlaw has been selected by the Board of State Harbor Commissioners to fill the post.

Also supported in Sacramento was a bill for urban redevelopment, which will be of material aid to the World Trade Center. This bill has passed both houses and will be signed by the governor.

Maritime Promotion

To encourage interest in and support of maritime activities that will benefit Bay Area shipping activities, there were arranged several radio programs in which shipping executives participated. It is hoped that a regular series of weekly programs, financed by the industry, can be provided.

Several exhibits of note were arranged on the Exchange Floor. The Norwegian Information Services exhibit, which included a large map depicting the huge losses suffered by Norway's merchant marine, was well attended. It earned a flattering compliment from Norway's ambassador to the United States.

The United States Maritime Service photographic exhibit of the Service's activities was opened on National Maritime Day, with a concert by the band of the Alameda Officers School. This was the first showing of the exhibit, which is now on tour of the country.

Of great interest was a display by the American-Russian Institute. Its opening was attended by the delegates from the Soviet Union, Ukraine and Byelo Russia. Over 600 guests were present at the opening.

Now in preparation is an exhibit for the week of Harbor Day, August 6-12. Marine equipment will be on display at the Ferry Building. It is expected that an interesting show will be provided and that attendance may exceed that of last year, estimated at over 100,000.

World Trade Center

With the passage by the Stat Legislature of the urban redevelop ment bill, the decks are cleared fo action by the trustees of World Trad Center, Inc.

This bill has been supported b San Francisco and other cities of th Bay Area. It permits condemnatio of property by cities and their leas ing it for development.

The trustees have been active i completing plans for financing an amortization.

A large and attractive model o the project was made by the Rober S. Atkins men's clothing store an displayed in its windows. It is nov planned to place the model on dis play in the City Hall at San Fran cisco's Civic Center.

Bay Area Maritime Committee

The twelve-county committee i now approaching its third anniver sary on Harbor Day, August 11.

This body has been a potent fac tor in securing community suppor for projects which, while they would directly benefit a particular location would bring advantages to the area as a whole. It has enabled bringing the influence of twelve counties to gether, when any one of them needed assistance.

Joint action has been successfully brought to bear in assistance of the World Trade Center, river and har bor improvements and highway de velopment. The committee is solidly supporting the establishment of a foreign trade zone in the area.

Directory

A classified directory of the greatly expanded roster of the Marine Exchange is ready for distribution. It should prove to be a valuable aid to buyers for steamship companies and shipyards.

The Exchange is also lending its support to the preparation of a directory of exporters and importers of the Bay Area. This will be classified as to products and is intended for foreign distribution.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton



BEFORE PEARL HARBOR

Pacific Coast shipping men will be interested in the illustration herewith which shows a luncheon iven in honor of Arthur M. Tode, honorary president, The Propeller Club of the United States, on he occasion of his visit to Honolulu in 1940. Particularly of interest is the presence of the late E. E. ohnson (first man in front row), Oriental representative of the U. S. Maritime Commission, who was aptured and later killed by the Japanese in the Philippines. The picture is published through the ourtesy of Arthur M. Tode.







Left: Mariner's president, Thomas A. Short, with the skipper of the Catalina.

Center: Bud Stewart, Bill Quoyle, Ed McCarthy, and Bern De Rochie.

Right: The harbor transport, Catalina, pulling out for tour of San Francisco Bay.

HOLIDAY FOR VETERANS STAGED BY MARINERS

A San Francisco bay excursion for 456 wounded veterans from Letterman, Oak Knoll, Oakland A.S.F. Regional Hospital, Treasure Island Receiving Station and other Bay Area hospitals, was organized and sponsored by The Mariners Club of California. The Harbor transport, Catalina, was provided by the Army Service Force for the trip on June 17.

At 10 a.m. on a warm Sunday morning the Catalina pulled away from the dock loaded with veterans and their 450 hostesses, the WACs, WAVES, SPARS, Lady Marines and Nurses of the hospitals, while the Mariner's members played host. The cruise around the bay took in a jaunt up to the Sacramento river mouth.

Food and refreshments were served, including the donation of 5000 Coca-Cola's and 3000 Love Nests, according to one Club member. Entertainment was provided and the music was the band of the Volunteer Port Security U. S. Coast Guard directed by C. W. Sellick, W. O., U. S. C. G., to which the happy convalescents and their partners cut the rug, even those on crutches. Dick Glissman, club member, was fog horn as well as master of ceremonies along with Frank De Pue.

To some, this cruise was the first opportunity to see San Francisco harbor and enjoy the California sun since leaving ship on a stretcher, and in all it was a gala day long to be remembered by the servicemen and women.

A toast to the Mariners Club and their President, Thomas A. Short—a successful trip well planned!



This happy twosome, a lady marine and sailor, are having a whirl for themselves seeing San Francisco for the first time while on a holiday.



The veterans and their hostesses disembarking the Catalina after a happy excursion on June 17.



Lunch aboard. Consisting of cokes, sandwiches, candy and other refreshments, the servicemen and women had a picnic.













Left, vertical strip (top): Some of those aboard the Catalina. The reception committee, Captain W. T. Hunter and Fletcher Mansen, greet a WAVE. You can see by the crowd that a good time was had by all.

Right, vertical strip (top): The hostesses of the day emborking the Catalina. Center: George E. Swett and Robert D. Saear welcoming a wounded sailor aboard. Bottom: The MP's about to throw overboard Dick "Fog Horn" Glissman and Frank De Pue, the masters of ceremonies for the excursion.



Have You Met Barbara Watson?

By B. H. BOYNTON

A young woman with a line—a steamship line!

Ice skating is an unusual hobby for a steamship office manager. So is fencing and horseshow riding in which she is the winner of many trophies, and her dog, Nonja, a Chihuahua, but they all have a devotee in Miss Barbara Watson, California operational manager of American Mail Line.

Miss Watson and her position are also unusual. Born in the Indian Territory, she grew up "all over the country," her father being a railroad man.

Transportation has motivated her life. She spent her early business years with the Missouri, Kansas & Texas Railroad, as a clerk in the Kansas City, Mo. main branch office. After moving to San Francisco, however, she connected up with the Java Pacific Steamship Line, and from there, in the pre-war period, with the Division of Emergency Shipping, which was absorbed into the War Shipping Administration in February, 1942. A. R. Lintner was Pacific Coast director of W.S.A. and also Miss Watson's boss.

When Mr. Lintner retired to his duties as vice president and general manager of American Mail in Seattle, Washington, the home office, and felt that his company needed an operational branch in San Francisco to govern the California Territory, he picked Miss Watson for the job. So, she has been running a busy steamship office since 1943, with T. A. Mithassel, port captain and Q. D. Higgins, port engineer. The San Francisco office is located at 369 Pine Street.

The American Mail Line was reorganized in 1940 under the direction of Lawrence Calvert, S. L. Barnes, E. D. Doran and A. R. Lintner. Richard J. Reynolds, Jr., of the Reynolds Tobacco family and the Reynolds Metals Co., is heavily interested. Office in Seattle, Washington opened on April 1, 1940 with the experienced shipping manager and vice president in active charge. Delivery of the first vessel was taken on April 6.

The company is, at present, negotiating for a fleet of fast ships for freight and passenger service from the Pacific Northwest to the Orient and South Pacific.

Miss Watson considers her association with with the Division of Emergency Shipping prior to Pearl Harbor, as one of the outstanding experiences of her career. She calls it "fortifying the Pacific Isles from a fruit box in Grand Central Station." This name, because the quarters for such a Division was one small room for three men and their tools, and an adjoining room which must have been a clothes closet, consisting of a fruit box for a typewriter stand and seat, for her "private office." All comers must pass this "private office" in order to enter the Division of Emergency Shipping, and at the end of a day, an accumulation of cigarette stubs and cigar butts made a trail through this pocket-size office, a homely reminder to Grand Central Station during wartimes.

Presenting Miss Barbara Watson, California operational manager, American Mail Line.



(1) Distinguished Middle Eastern leaders conferred with Jerome Doolon, director of Bechtel-McCone Corporation, aboard the tanker Palomo Hills during the trial run. They are H. R. H. Amir Faisal (left) and H. E. Shaikh Hafiz Wahba. Both were delegates to the Conference in San Francisco.

(2) Led by R. W. Adoms of Marinship, H. R. H. Amir Faisal and guests go aboard the tanker for the trial run on San Francisco Bay. In the foreground is the flag of Saudi Arabia.

(3) Led by H. R. H. Amir Faisal, Minister for Foreign Affairs of the Kingdom of Saudi Arabia, royal guests descend from the midship deckhouse onto the catwalk.

(4) The Arabian party walk through the shipyard at Sausalito on May 12, prior to their embarking on the trial run.

MARINSHIP ENTERTAINS ARAB DELEGATES

Colorful members of the royal Arabian delegation to the San Francisco Security Conference were guests of Marinship Corporation at Sausalito on May 12.

H. R. H. Amir Faisal ibn Abdul Aziz of Saudi Arabia and other members of his party, in their spectacular white and gold burnooses, watched Mrs. Thomas G. McGuire of Piedmont christen the tanker Belridge Hills. Following the launching and luncheon on the USS Tamalpais, they boarded the tanker Paloma Hills for a three hour bay test trip.

Delegates from many other countries to the United Nations Conference were also guests of shipyard during this occasion.

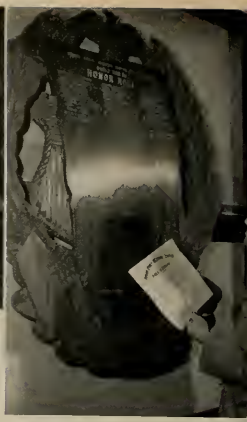
Prince Faisal is chairman of the Saudi Arabian delegation. He is also minister for foreign affairs in that country. His father is Ibn Saud, King of Saudi Arabia.

Left: The Sheik of Araby, junior size, fascinates this young lady with his oriental burnoose and dazzling smile, as she asked him for his autograph in true American fashion.
Center: K. K. Bechtel (right), president of Marinship, presents to H. R. H. Amir Faisal a picture book story of the trial run on the tanker Palomo Hills, on which the royal Arabian party were guests. Looking on is Robert W. Adams, Marinship executive.
Right: Under the two large colorful tents set up in honor of an ancient custom of Arabia, on the tanker USS Tamalpais, luncheon was served by the world famed chef, Mordikian. Food fit for royalty is being given the tiny prince, grandson of King Ibn Saud of Arabia and son of the Foreign Affairs Minister, by George Mordikian.









Left and center: The "take-it-off" ceremony during graduation exercises when the officer candidate removes the black braid to reveal his Ensign's stripes. Right: The proudest graduate in 1945 Class, Ensign James E. Thompson, who promised his son, the late Ensign Glen E. Thompson, USMS, that he would enter school. On the day of his entrance, the Port Chicago explosion killed his son, who was the Quinault Victory's engineer officer. Shown here, upon graduation, the father visited the Honor Roll which includes his son's name.

Graduation Day At U. S. M. S. Officers' School of Alameda

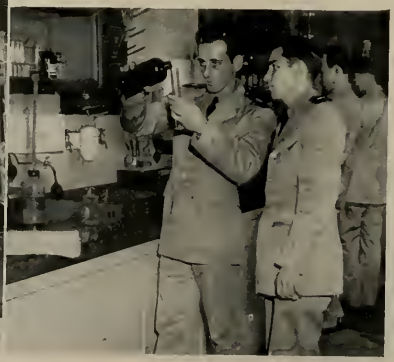
The success of the U. S. Maritime Service Officers' School of Alameda, California, is proven by the splendid record of its graduates in the merchant service. More than 6000 officers have been commissioned from this station and many have risen from their original third mate's and third assistant engineer's licenses to become captains and chief engineers, respectively. The station's honor roll, which contains the names of 51 graduates lost at sea, indicates the danger which these new officers face. One out of every 120 has been lost in this war.

This school, functioning as a part of the War Shipping Administration, Training Organization, trains qualified seamen efficiently so that they may become competent to assume charge of the merchant vessels which carry troops, munitions, food and fuel to every invasion front.

War-stimulated education for the Merchant Marine is meeting the present emergency demand, and it will point the way toward continued training for this service after V-J day, for making the greatest peacetime merchant fleet.

Courses, technical in nature, are intensified in a four months' period. A new motion picture, "Life and Studies of an Officer Candidate," was





Left: An officer candidate in basic physics class goes through a boiler feedwater experiment at the U. S. Maritime Service Officers' School. Part of the equipment for students at the school is a section of a Liberty ship boiler. At right: Analysis of feedwater helps in conditioning modern high-pressure boilers aboard ships, and the officer candidates have a regular class in feedwater. Richard Clintworth of Section S034-E pours while Peter Golanis, of same section, looks on.

recently completed to assist in the speedy orientation of incoming officer candidates. The film, all in color, acquaints students with the methods and problems to be faced, enabling them to buckle down to school life more quickly. At one time 7 days were required for such preliminaries as aptitude tests, clothing, bedding, room assignments, meeting with officers, answering of questionnaires, and physical examinations. Use of this film has reduced this period to four days, thereby saving three valuable days for training.

This motion picture has now been made available for showing to fraternal, civic and service groups, to further acquaint citizens with the excellent job that the Alameda school is doing.

The training program itself is a comprehensive, integrated program to provide officer candidates with as much knowledge as is possible in four short months. All officers of the station have cooperated in formulating standardized courses, co-ordinated with the use of training aids and demonstration-laboratory methods. Field trips to marine works, observatories, shipyards and refrigeration plants, help to make the training program highly effective.

The future of the merchant marine in peacetime depends in large part on the training and experience of the new officers coming up through the ranks.







(1 and 2) The championship crew of the school. Near the finish line of a thrilling boat race which made the school victor against USMS Cadet Basic School and USMS Training Station, Avalon.

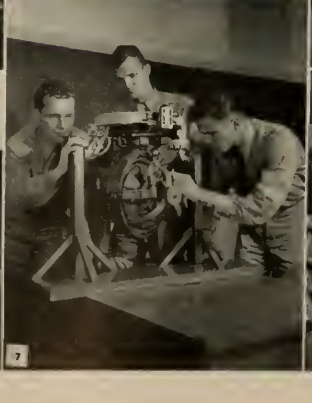
(3) Typical Saturday morning inspection at Alameda. Captain H. H. Dreany, USMS, Asst. Commandant, visiting from Washington, D. C., is at the left. Captain M. E. Crossman, USMS, Superintendent, is on right.

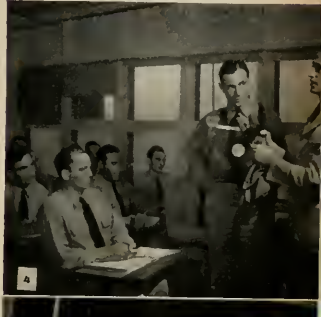
(4) Ensign Ben. McPhun demonstrates the safety factor in an oxygen breathing apparatus.

(5) A diesel class in session. The instructor shows the fundamentals of the fuel pump.

(6) A class in auxiliary machinery studies refrigeration under Lt. (jg) Richard Canham, USMS.

(7) Three officer candidates attempt to discover the intricacies of the gyroscope, using this cutaway model in instrument class.











Above: Lt. Col. W. P. F. Brawner, USA, making presentation speech to the employees of Simmons Co., Pacific Division, San Francisco. Hoisting of the pennant during ceremonies. Commander Ellis K. Wakefield, USN, pins "E" badge on Ralph Nuckols, representing the employees of the firm. Colonel J. W. Lyons, USA, pinning an "E" badge on lapel of Harry Halleran, general manager of Simmons.

FLAG DAY AND SIMMONS AWARD DOUBLY CELEBRATED

Flag Day, June 14, was doubly celebrated by the employees of Simmons Co., Pacific Division plant at Bay and Powell Sts., San Francisco, to whom was presented the Army-Navy "E" award for efficiency in production of war materials.

A noteworthy address was made by the Master of Ceremonies, Bradford M. Melvin, prominent San Francisco attorney and president of the State Pilot Commission for the port of San Francisco.

The War Department was represented by Lt. Col. W. P. F. Brawner, chief of the production division, Chemical Warfare Service, who was assigned by Secretary of War to come from Washington to make the award. During his address he remarked:

"The Simmons plant is rather unusual in that it has won its 'E' by producing both offensive and defensive materiel for war. The many hundreds of thousands of service and civilian gas masks that you have turned out have acted as so many insurance policies against the use of poison gas by our enemies. Also, you have manufactured many tents for the Army, as well as thousands of hospital beds and bunks for the Navy. You can be proud of the part you are playing in sending thousands of tons of incendiary bombs to our Air Forces, first to Europe, now to the Pacific, and to know that the M-69 jellied gasoline bombs, for which you produce the casings, are being dropped by the millions by our B-29's on the industrial strongholds in Japan."

Commander Ellis K. Wakefield, director of Personnel Distribution, 12th Naval District, represented the Navy. He paid tribute and lauded the workers on the fine job done on the life jacket contract.

"In addition, you have produced for the Navy mattresses, mattress covers, pillow slips, table services, metal furniture of several types for shipboard use, bunks, and metal fence posts. Every one of these items has helped to speed the course of the war."

The employee representatives who had been selected to receive the merit badge were Mrs. Gladys Goldblatt and Ralph Nuckols.

As a curtain-raiser to the presentation ceremony the Simmons war workers earlier in the day sent a 500-lb bomb cluster to the City Hall where it was autographed by San Francisco's Mayor Roger D. Lapham who then attached to it a two-foot Simmons shipping tag addressed to the Mayor of Tokyo from the Mayor of San Francisco. On the cluster itself was lettered the inscription, "Tokyo Bound with the 'Burning' Regards of Simmons War Workers."





Left: Colonel J. W. Lyon, Chemical Warfare Service, showing M-69 jellied gasoline bomb, 38 of which make up the 500 lb. bomb cluster, which Mayor Roger D. Lapham has autographed to the Mayor of Tokyo.

Right: Part of the employees and honored guests at the presentation ceremonies.

Propeller Club Activities

AT THE VARIOUS PORTS



Commander M. O. Atkinson, USN, commanding officer of Marine Sergeant Leslie Hillyard, from Okinawa (at mike). Marine Sergeant Hillyard from San Bruno, Calif., spoke on the tough fighting on Okinawa. At left, Colonel Johnson and on right, Jos. Moore, Jr.

ODT Director Praises Deeds of Transport Industry

"The transportation industry created the American empire and transportation is dedicated to defend the American nation it created." These were the words of Colonel J. Monroe Johnson (honorary member of the Propeller Club of New York), national director, Office of Defense Transportation, as he told railroad officials and 200 persons attending the Propeller Club of San Francisco luncheon, that the biggest wartime transportation job is "now in the foreground."

Pointing out at the luncheon that the American Army in Europe is acknowledged to be one of the most powerful ever assembled and outfitted in all history, Colonel Johnson declared: "We got them there in about four years as miracle after miracle in transportation was accomplished. Now, this Army must be sent more than half way around the world in only 10 months."

He contrasted the 28½ million men-trips made by rail taking our forces to Europe in the four-year period with the tremendous task of 20 million men-trips now to be made in only 10 months. And whereas 20 to 25 per cent of the nation's war materials filtered through Pacific ports during the same period mentioned above, now the assignment is to move a 3 million men army largely across the country to crowded West Coast ports of embarkation where 60 per cent of America's war goods funnel out from western harbors to a contracting waterfront near Japan.

Scope of the ODT job involves a continuing steady flow of men and war goods westward on a high plateau of day and night movement for the next six months with a peak rate by September of 140 troop trains per day.

Guests at the Propeller Club luncheon meeting included **General Wallace Mason**, U. S. Army, S. F.; **Commander M. O. Atkinson**, USN; **Sergeant Leslie Hillyard**, U. S. Marine Corps, Okinawa; **Charles Elsey**, president, and **E. W. Mason**, vice president and gen. mgr. of Western Pacific; **D. J. Russell**, vice pres., **L. B. McDonald**, vice pres., **Harry Butler**, gen. mgr. dining cars and hotels, **A. T. Mercier**, president, **W. W. Hale**, vice pres., and **J. W. Corbett**, all of Southern Pacific; **C. H. Buford**, vice pres., Ass'n. American Railroads; and **Neils S. Laidlaw**, associate regional director of ports, coastwise and intercoastal (waterway transport department), Association of American Railroads.

Propeller Club Meeting

The monthly dinner meeting of the Propeller Club, Port of San Diego, took place at 7:00 p.m., June 12th, at the Cuyamaca Club. Ralph Chandler, representing the



C. H. Buford, vice president of operations and maintenance, Assn. of American Railroads, and Jas. Moore, Jr., president of the Port of San Francisco Propeller Club, show marked interest as Colonel J. Monroe Johnson (at mike) praises the transportation industry.



Propeller Club of the United States, "Charter Day" at University of Southern California, when National Vice President, Lee K. Vermille of the Propeller Club, presented the charter to USC's President, Von Kleinsmid.

Propeller Club, Port of Los Angeles-Long Beach, was a guest.

Following a top notch chicken dinner was a showing of sound movies in technicolor, covering a complete voyage of a tuna clipper and taking the audience through the cannery to follow the catch up to the sealed and labeled cans. After the movie, Charles Wallace, of the American Fishermen's Tuna Boat Association, discussed the tuna fishing and packing industry of Southern California, citing figures to show that the industry is as yet only in its infancy and the production possibilities of the future.

L. A. Propeller Club Election

H. E. Pickering, manager of W. H. Wickersham & Company, was elected president of the Propeller Club of the United States, Port of Los Angeles-Long Beach, at the annual election meeting on June 20 held at the Hilton Hotel in Long Beach. He succeeds Lee K. Vermille, attorney, of Overton, Lyman, Plumb, Price & Vermille.

Other officers elected are:

First vice president — Leo E. Archer, manager, Moore-McCormack Lines, Inc.

Second vice president — Leonard T. Backus, manager, Fireman's Fund Insurance Co.

Third vice president—E. A. MacMahon, district manager, Luckenbach Steamship Co., Inc.

Secretary-treasurer—Howard W. Woodruff, district manager, Williams, Dimond & Co.

The board of governors for the club, elected for one, two and three year terms, are as listed:

One Year Term

E. J. Amar, port manager, Long Beach Harbor Department.

Leo E. Archer.

Harold A. Black, attorney, McCutchen, Thomas, Matthew, Griffiths & Greene.

R. J. Chandler, vice president, Matson Navigation Co.

H. E. Pickering.

W. Kenneth Pope, vice president and southwest manager, Pope & Talbot, Inc., McCormick Steamship Division.

Two Year Term

F. A. Hooper, district manager, American-Hawaiian Steamship Co.

I. C. Johnson, Rear Admiral, United States Navy (Ret.).

E. A. MacMahon.

H. R. Pauley, executive vice president, The Petrol Corp.

W. A. St. Amant, manager, W. R. Grace & Co.

L. K. Vermille.

Three Year Term

Alvin L. Allyn, engineer and chemist, Cardox Western, Inc.

Leonard T. Backus, manager, Fireman's Fund Insurance Co.

James G. Craig, treasurer, Craig Shipbuilding Co.

Arthur Eldridge, general manager, Los Angeles Harbor Department.

Max G. Linder, president, Transmarine Navigation Corp.

Edgar M. Wilson, general agent, American President Lines, Ltd.

Port Group Elects Thomas Coakley Helmsman

The California Association of Port Authorities, in its annual meeting held on June 15 at San Francisco, elected Thomas Coakley, member of the Board of State Harbor Commissioners, San Francisco, as president, and adopted resolutions calling upon Congress and the Interstate Commerce Commission to bring them relief from two major headaches now confronting them.

(Continued on page 88)

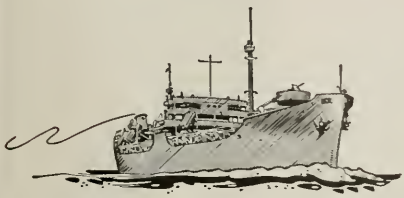
COAST GUARD CADETS RECEIVE CHARTER

Coast Guard Cadets receive Propeller Club charter at the New London, Connecticut, Coast Guard Academy. Rear Admiral James Pine, USCG (second from left), superintendent of the Academy, presents the charter to the Port to cadet officers. The three cadets, respectively, president, vice president and secretary of club, are, l to r: Clifford Peistrup, Donald E. Ullery, and John P. Oborski. And at extreme left is Comm. A. A. Lawrence, USCG, Faculty Adviser for the newly formed unit.



Pipelines to Tokyo

—a Fleet of Tankers Built and Repaired by Marinship Workers



A MESSAGE FROM THE EMPLOYEES OF MARINSHIP CORPORATION, SAUSALITO, CALIFORNIA

SOME PEOPLE asked us why we built the tanker *Huntington Hills* in only 33 days . . . whether it was worth all that sweat and grief to turn out a ship 26 days faster than any other tanker in history. Well, here's how we would explain it.

Our Marinship tankers, they tell us, are carrying gasoline all over the Pacific. They are like a big fast-moving *pipeline to Tokyo,* branching out on all sides . . . to Okinawa and Guam and Manila . . . but aimed mostly right at the guts of Japan.

So, when we built the *Huntington Hills* and sent her out 26 days faster than any tanker in history, we were just borrowing a little time from the schedule. We were saying to the soldier, out there somewhere, "Here, take this tanker with our compliments . . . the next 26 days are *on us!* Take this extra gasoline, and then *give 'em hell!"*

It's a swell feeling to know that you've sent a tanker out, loaded with enough gasoline to refuel an entire task force, so that it can make a complete trip *before the schedule said it was supposed to start.* It means that, on our calendar, we've shoved our part of the war effort up almost a month. We've heard of "stunts," and that some of them cost a lot of money. So we're proud that this was the cheapest ship we ever built, and that it *saved a lot of Uncle Sam's money.*

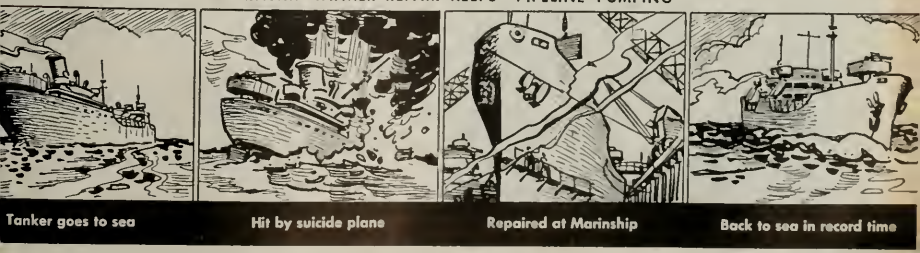
We know from experience that any pipeline needs repair, to keep it pumping. With all those Jap-happy suicide planes, it's no wonder Uncle Sam has asked us to take on *ship repair* work, even while we are still building new tankers. So, from now on, over at Marinship we'll be building the "pipeline". . . and we'll also see that the *pipeline is kept in repair.*

Production records are a dime a dozen these days, so we don't think of our 33-day tanker that way. We just figure like this: they give a soldier a job to do and he does it the best he can. So, when they gave us a job to do, we all pitched in together and hit it hard.

And we'll keep at it from now on, just like that . . . *building* the tankers, and *repairing* them . . . fast and well. Our boys deserve the best.

Marinship Workers

MARINSHIP TANKER REPAIR KEEPS "PIPELINE PUMPING"



HIGH LIGHTS OF THE WOAMM'S FIRST YEAR

At the close of the first year, the Women's Organization for the American Merchant Marine, Port of San Francisco, can review with pride the service and promotional activities they have accomplished.

This group started out with a small gathering of fifteen women, May 9, 1944, through the efforts of Mrs. Earle H. Carder, the first president of the club, and Mrs. Harry W. Parsons. Since then, it has grown to a membership of over 135 active members.

During the June meeting, high lights of the past year were related by the club's historian, Mrs. B. Hamilton Moore. Interesting speakers headlined each monthly meeting and their informative subjects were an inspiration to the club as shown by the varied and successful projects the club has undertaken. The club served as hostesses at the United Seamen's Art Exhibit held in San Francisco last fall, with Mrs. James S. Hines, chairman; a Ship Model exhibit held at the Marine Exchange which drew a large crowd for several weeks, under the chairmanship of Mrs. B. Hamilton Moore; on Victory Fleet Day, in September, the club served at the U. S. Maritime Service Center during a luncheon for 250 shipping men; in December, they were guests of Captain M. E. Crossman at the Officers' School for the Merchant Marine at Alameda; from November to April, under the able leadership of Mrs. Allan Toole, they conducted a Ship Model contest for young boys in four western states. They worked out a promotional campaign in the newspapers and weeklies in 645 papers and sent out plans of two thousand Victory ships for distribution by Scoutmasters. The winner of this contest was Bill McFall, age 13, of Sacramento, California, who was honored by having his mother sponsor a Richmond shipyard vessel.

The "Adopt-a-Ship" program was introduced to the schools throughout the eleven western states by Mrs. Babb and her committee. The plan is to educate the school children through correspondence with the Captain of the adopted ship, to the life at sea and the vital functions of the merchant fleet in war and peace. This program reached some 200 schools during the year, and letters were written to many Captains, with the result that 15 completed adoption of ships took place.

The "Davy Jones Locker," canteen for merchant seamen at the U. S. Maritime Service Center at 1000 Geary Street, San Francisco, was established in December of 1944, by the WOAMM's and the canteen served and entertained some 4500 men during its six months' operation, men who are waiting assignment to ships after they have finished their basic training for the Merchant Marine. The canteen is open afternoons and evenings except Saturdays and Sundays, and serves hot dogs, pies, cakes, milk and coffee, provides recreational facilities to the men, and offers entertainment and dances once a week. Much planning and volunteer work goes into this service, making the canteen a success with the men and a triumph for the club.

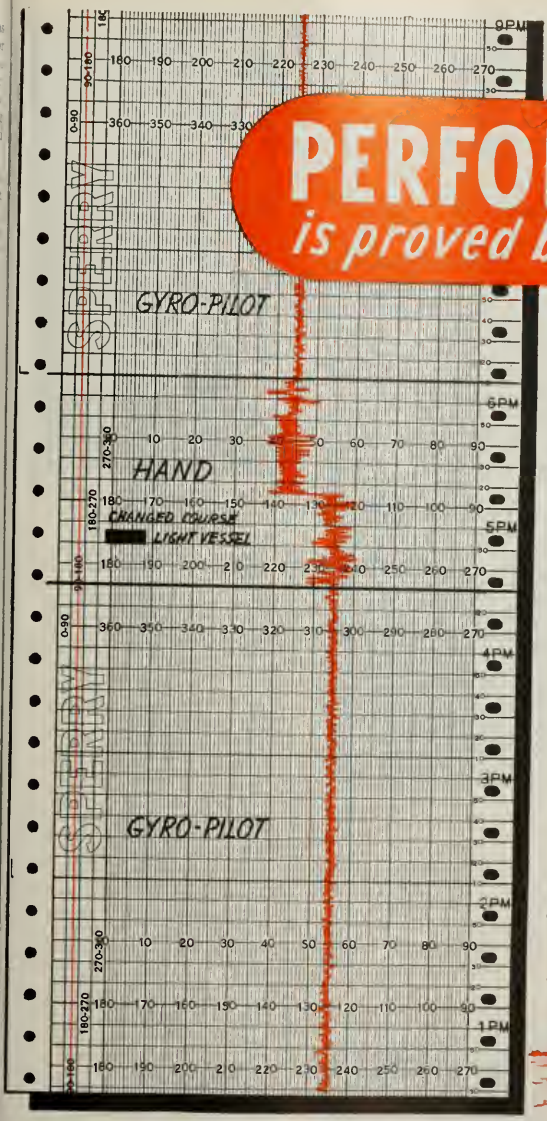
During the June meeting Mrs. Henry F. Grady graciously presided at the installation of new officers ceremony, introducing the new President, Mrs. Frank Short, and the following officers for the 1945-1946 term: Mrs. Allan Toole, first vice president; Mrs. Frazer Bailey, second vice president; Mrs. Paul Cronk, treasurer; Miss Elizabeth Magee, corresponding secretary; Mrs. David Currier, recording secretary; and Mrs. Byron Pickard, historian. The new board of directors includes: Mrs. Earle H. Carder, Mrs. James S. Hines and Mrs. John F. Johnston, for the one-year period. For the three-year term Mrs. Hugh Gallagher and Mrs. A. Lillevand and Mrs. Charles Wheeler. For the two-year period Mrs. J. A. McKeowan, Mrs. Harry Parsons and Mrs. Clyde Williamson.



Mrs. Paul Cronk presents the WOAMM's token of appreciation to retiring president, Mrs. Earle Carder.



Officers of the WOAMM for 1944 and 1945 terms. Seated, l to r: Mrs. J. A. McKeowan, Mrs. F. Johnston, Mrs. Allan Toole, and Mrs. Harry W. Parsons. Standl to r: Miss Elizabeth Magee, Mrs. B. Hamilton Moore, Mrs. Byron Pickard, Mrs. James S. Hines, Mrs. Frank Short, now pres.; Mrs. Henry F. Grady, guest who presided over the installation of officers; Mrs. Earle H. Carder, Mrs. Paul Cronk and Mrs. David Currier.



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The advantages of automatic steering are just as pronounced for *small* ships as for large ones. Operating costs are lowered . . . in many cases in a greatly increased ratio.

Our long experience in this field is at your disposal, no matter what type of vessel you operate.

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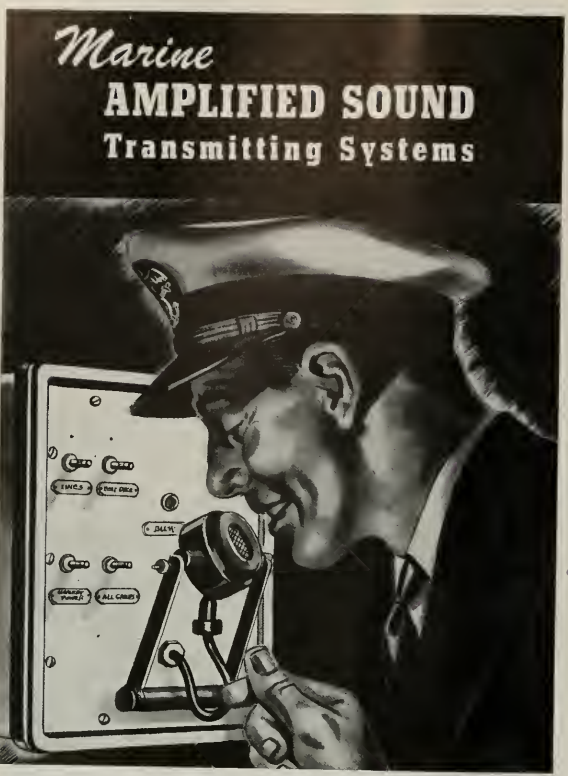
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S. F. Port Manager

Appointment of Neil S. Laidlaw as San Francisco's first port manager, was hailed by marine interests as a forward step in the post-war development of San Francisco and the rest



Neil S. Laidlaw, first port manager of San Francisco.

of the Bay's maritime industry. He assumes his $12,000 a year job with the Harbor Commission October 1.

Laidlaw said that as he sees his duties, his first and paramount effort will be devoted to cooperation with the military and naval authorities to the utmost until the war is won. Second, a post-war job of "salesmanship and administration to recapture business lost to the port and to attract new business through efficiency in service."

The Board of Harbor Commissioners for the Port of San Francisco is the last port operating body on the Pacific Coast to set up a managerial system for its waterfront.

Laidlaw, born in San Francisco 49 years ago, has been co-ordinator for the Pacific Coast with the Office of Defense Transportation and has served as liaison officer between steamship and railroad operators in keeping freight moving and has been commended time and again for "a job well done."

In 1914, Laidlaw began his West Coast shipping career, starting with the old Pacific Coast Steamship Company when they had their terminals at the old Broadway piers. He served in the first world war and later was in Japan representing a British stevedoring concern in Kobe. He was also identified with the former firm of Swayne & Hoyt as traffic manager.



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In port or on the high seas — in calm or heavy weather — you can tell, at a glance, the degree of list or roll of your ship. The John L. Chaney Ship Clinometer is a precision-built navigating instrument that gives you quick, positive information — without guesswork — without calculations for overthrow.

Placed anywhere on the ship — in the engine room, on the bridge, in the chart room, on the extreme port or starboard side — this Clinometer indicates list or roll with unerring accuracy.

The operation is silent and accurate — no overthrow — nothing to adjust or compute — nothing to get out of order — no bearings to oil, corrode, or wear out — guesswork is eliminated. Installation is simple, adjustments unnecessary. The U. S. Navy and U. S. Maritime Commission make wide use of John L. Chaney Ship Clinometers — they have proved their worth.

The price is $12.50 each. At this low cost you can afford to have a Chaney Clinometer at a number of places throughout the ship. Order now. If not entirely satisfied after examination, return the Clinometer and your money will be promptly refunded.

Actual size of John L. Chaney clinometer — 12⅜" wide—6¼" deep — curved tube is 16" long and ⅝" in dia.

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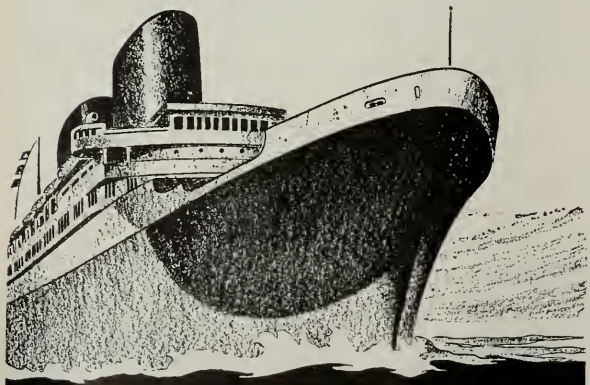
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Increases Boiler Efficiency

Stack temperature readings provide one measure of boiler efficiency. Flue temperature charts made before and after using XZIT definitely prove its effectiveness. In practically every case where XZIT has been used to remove soot and fire-scale, a substantial increase in operating efficiency has resulted.

XZIT is fed into the fire-box, and does its work while the boiler continues operating. Continued use of XZIT keeps heating surfaces clean for maximum heat transfer, stops sparking and stack fires immediately. Write for full information.



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New Refrigeration Engineering & Supply Company



Fred Esser, marine engineer with Refrigeration Components.

Fred Esser recently announced the opening of the office and warehouse of Refrigeration Components in San Francisco, a concern offering refrigeration equipment, supplies, and refrigeration design to the marine industry.

Esser, a marine engineer, is well known on the Pacific Coast from Los Angeles to Alaska, and within recent years he has devoted most of his time to the problems of marine refrigeration. During the past three years he has designed and supervised the complete installation of refrigeration equipment in more than 200 Navy and Army transports.

Appointment

Harry E. Sargent has been appointed Pacific Coast manager of the Marine Division, it was announced by Worthington Pump and Machinery Corporation. He will supervise the Corporation's Marine sales activities through the Los Angeles, San Francisco and Seattle district offices.

Addition to Borg-Warner

Borg-Warner International's aim to create a single source of supply for foreign importers of automobile, truck, and tractor functional parts had moved a step nearer realization today with the addition of AP Parts Corporation, Toledo, Ohio, manufacturers of automobile mufflers and tail pipes. The new representation is the second announced in less than a week by **J. L. Cunningham**, general manager, and increases to 17 the manufacturers whose goods are supplied overseas distributors of Borg-Warner International.

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W. R. C. Appoints Director



W. Spraragen, executive secretary of the Welding Research Council.

The Welding Research Council of the Engineering Foundation has announced the appointment of W. Spraragen, present executive secretary of the Council, to the newly-created position of Director. The Welding Research Council is a co-operative scientific research organization which is engaged actively in the study of matters related to the science and art of welding. Sponsored by the American Welding Society and the American Institute of Electrical Engineers it operates in close cooperation with all major engineering societies. It has an annual budget of more than a quarter of a million dollars and these funds for research are provided by large users of welding and welded products, and various governmental agencies.

Mr. Spraragen has long been identified with research and welding. He has served as executive secretary of the Welding Research Council since its organization in 1935 and his connection with the welding industry dates back to 1918 when he was appointed Research Assistant to the Welding Research Committee of the National Council of Defense and the Emergency Fleet Corporation.

Procurement Director

C. Irving Hansen has entered on duty as Director of the Division of Procurement for the United States Maritime Commission, replacing E. C. Walsh, Jr., who resigned, it was announced May 7.

Mr. Hansen has recently returned from Iran where he was associated with the American Financial Mission as Administrator of Procurement Division and Director General of the State General and Supply Corporation.

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Brickseal will not crack or peel off due to sudden temperature changes, because it remains semi-plastic until the furnace cools. Brickseal prolongs the life of a new or old refractories for a fraction of the cost of relining.

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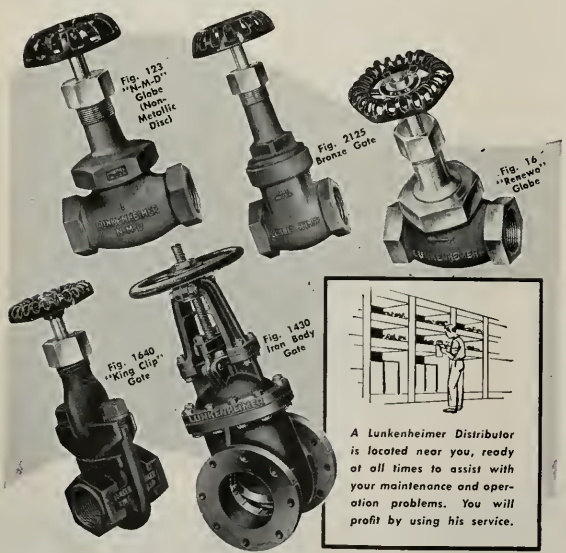
TIGHT VALVES CONSERVE FUEL

PREVENT HOLD-UPS IN PRODUCTION

LUNKENHEIMER VALVES STAY TIGHT WITH LESS CARE

With today's production problems and the urgent necessity for conserving fuel, it is more important than ever to avoid wasteful, costly, production-lowering valve leakage. It's good business to maintain a regular check on valves, to make sure that they are *tight* and in proper working order. Maintenance men prefer Lunkenheimer Valves. They know these *quality-built* Valves serve longer and better on the job—are easier to keep tight with a minimum of time, labor, and expense.

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LUNKENHEIMER VALVES

BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S. P.; BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS



John Gammie associated with States Marine Corporation.

Cunarder Joins States Marine

John Gammie, deputy representative in the U. S. A. of the British Ministry of War Transport, who, prior to the war, held the position of assistant general manager of Cunard-White Star Limited in the United States, will become associated with States Marine Corporation after the completion of his war duties.

Mr. Gammie is widely and favorably known in shipping circles and is recognized as an authority on the U. S./United Kingdom freight and passenger trades.

States Marine Corporation prior to the war conducted steamship services between the United States and Canada, United Kingdom, West Indies, South and East Africa, China, Japan and the Philippines, in addition to operating world-wide tramp services. Their vessels are presently under requisition charter to the War Shipping Administration for whom they are acting as General Agents.

Ad Manager Returns

Lester M. Clayberger, who for the past 28 months has been with Uncle Sam's famed Sea Bees, has returned to his former post as advertising manager, Paints and Building Materials Division of The Paraffine Companies, Inc.

As Lieutenant Commander, Clayberger was the Executive Officer of a Construction Battalion which saw much active and rugged service in the Central Pacific. His unit went in with the Marines on several islands, building airfields, roads, and other necessary facilities for carrying the war on to Tokyo.

f your license were suddenly

SUSPENDED..



. . . would you be "on the spot" financially?

Whenever there is a casualty, regardless of who is at lt, you officers must take the blame.
And this frequently results in your license being sus-nded, if not revoked.
As you well know, having one's license suspended or re-ked has put many a merchant officer on the spot ancially.
For some years past, British merchant officers have had otection against this and similar mishappenings. For r a decade many American merchant officers have ured themselves against this ever-present possibility. A tested type of insurance . . . issued only to American rchant officers . . . offers all of these benefits —

1. Free legal representation at any inquiry.
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se special policies are underwritten by a group formed three of America's oldest and most prominent insur-e companies . . . and appeal not only to individual ers, but to Associations and other groups, as well as o-operators.
World-wide protection against just such casualties that happen to all who follow the sea. Write for particu-to K. L. Daniels, Gen. Agt., 220 Montgomery Street, Francisco 4, Calif. Telephone GArfield 2626.

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ERRATUM

Our humble apologies to Ferdinand Schmitz, president of Everett Pacific Shipbuilding & Drydock Company, Everett, Washington. Here he is. He is not the man whose picture we ran on page 73 of our May issue.

SHORESIDE PERSONALITIES

TWO U.S.M.C. ADMIRALS.

Two executives who rank among the foremost in the building and manning of the world's largest merchant marine have their names proposed for top-flight post in the American Navy.

The House Naval Affairs Committee has approved a bill to advance **Vice Admiral Emory S. Land,** USN (Ret.) to the honorary rank of Admiral, in recognition of his service as Chairman of the Maritime Commission.

Also before this body is the motion to advance **Captain Edward Macauley,** USN (Ret.), vice-chairman in charge of ship manning and recruitment, to the honorary rank of Rear Admiral.

NEW MATSON VICE PRESIDENT. Ralph J. Chandler, Southern California manager for Matson Navigation since the concern took over the Los Angeles Steamship Company, is now a vice president, following a meeting of the board of directors.

Chandler was vice president and general manager of LASSCO, when the line was operating the liners Yale and Harvard, coastwise, and running the Hawaiian service with the City of Honolulu, City of Los Angeles and Calawaii.

BILL HARROWER RETIRES. The long career and enviable shipbuilding accomplishments of William "Billy" Harrower has ended in retirement for the popular former Moore Dry Dock Company official.

For more than a quarter of a century as chief estimator for this concern, "Billy" Harrower recently closed his office and bade goodbye to his fellow associates, with plans of sojourning with relatives in Southern California.

N. W. AGENT FOR HIGGINS. Washington Boat Works of Seattle has been appointed agent for the Higgins Industries Inc., New Orleans, for western Washington and Alaska. The announcement was made following a trip to the North by George W. Rappleyea, vice president of Higgins.

LIETZ NAVIGATIONAL INSTRUMENTS *Since 1882*

BINNACLES — COMPASSES — ELECTRIC AND HAND OPERATED SOUNDING MACHINES — SOUNDING TUBES — LEADS — FATHOM SCALES — BOOM FAIR LEADS — PLAIN AND SWIVEL TYPE.

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'LET'S USE REX-WELD!"



. that's a familiar refrain
ong engineers and produc-
n men in every field—
sel, oil, power, machinery,
el and many others. It's
hard to understand why
K-WELD has achieved such
h standing with users of
ible metal hose!

National Supply Company Diesel with RW-89 All-Steel Diesel Exhaust Unit.

r industrial men know that REX-WELD Flexible
etal Hose provides an added measure of strength and
pendability for heavy-duty jobs. That's because it is
oricated from strip metal by a precision autogenous
lding process that makes *a weld stronger than the tube.*
addition, C.M.H.'s advanced "50-50" principle of
nstruction produces deep, uniform corrugations with
s working of the tube walls. The result—flexible
tal hose with greater inherent strength . . . extra
ibility . . . longer service life!

They know, too, that REX-WELD has the ruggedness
withstand extremes of pressure and temperature.
at in addition, it is leakproof in conveying searching
ds; pressure-tight; and able to with-
nd prolonged vibration and flexing.

mall wonder, then, that when the
calls for flexible metal hose—indus-
l men say, "Let's use REX-WELD!"
nsult C.M.H. about how REX-WELD
meet *your* requirements.

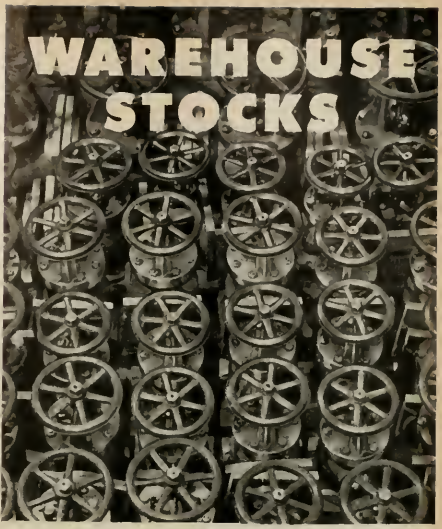


RW-89 Diesel Exhaust Unit.

Flexible Metal Hose for Every Industrial Use

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Plants: Maywood and Elgin, Ill.



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PORT GROUP ELECTS COAKLEY

(Continued from page 436)

Coakley succeeds A. M. Rosenfeld, former Los Angeles Harbor Commissioner.

Other officers elected were:

Vice president — Charles B. Howard, president of Howard Terminal, Oakland.

Secretary—Mark Gates, secretary of the Board of State Harbor Commissioners, San Francisco.

Treasurer—Fred Parr, president of the Parr-Richmond Terminals.

Attending the meeting with the above named officers were the following:

R. K. Hunter, traffic manager, and Carl Smith, assistant secretary, Board of State Harbor Commissioners, San Francisco.

Eugene Overton, president; M. G. Rouse, secretary, and Arthur Eldridge, general manager, Los Angeles Board of Harbor Commissioners.

Arthur Ables, port manager, Oakland.

John L. Kelly, vice president; George Rochester, secretary; General J. J. Mead, commissioner; E. J. Amar, port manager; Charles Bland, traffic manager; B. W. Tarwater, chief accountant, and R. R. Shoemaker, chief engineer, Long Beach Board of Harbor Commissioners.

Henry Ahm, port director, and C. W. Phelps, terminal agent, Port of Stockton.

Joe Brennan, Port of San Diego.

C. P. Howard, president, and John P. Ventre, traffic manager, Howard Terminal, Oakland.

H. E. Van Horn, president, Encinal Terminals.

G. L. Cox, traffic manager, Parr-Richmond Terminals.

H. C. Cantelow, manager, Marine Terminal Association.

Congress was asked by the Association to enact laws which will serve to confirm the titles of tide lands for various states, because on many of them, as in California, immensely important and valuable state and municipal properties have been built.

The Interstate Commerce Commission was asked to modify the Pacific Coast Fourth Section Order, in order that water carriers may stand on their own feet and make rate increases contingent upon financial showings, rather than be forced to confer with competitive rail lines before any changes can be made.

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HALF MODELS . . . For the men who lay out the ship's plating.

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LARGE SCALE MODELS . . . Fully detailed, decorated models, showing the completed ship from stem to stern, keel to topmast. A tangible record of shipyard achievement and an inspiration for all shipyard personnel.

VAN RYPER · VINEYARD HAVEN · MASSACHUSETTS

Shoreside Personalities

Ship Citations

A MARINSHIP BUILT TANKER, for the account of the U.S.M.C., the SS Torrance Hills, played a heroic role in the rescue of ten Navy fliers whose plane had crashed.

Vice Admiral D. W. Bagley, USN, commander of the Hawaiian Sea Frontier, issued a commendation citing the quick, intelligent action and seamanship displayed by the Torrance Hill's master, Captain L. C. Welter.

The rescue took place the morning of May 4, 220 miles from the nearest land.

CAPTAIN CHARLES S. ROBBINS of San Francisco, his officers and crew of the SS Juan De Fuca, built by the Oregon Shipyard, was cited by Brig. General W. C. Dunckel of the Western Visayan Task Force for their heroic efforts in saving the ship and its valuable cargo despite an attack by three Jap planes, one of which set the ship afire. The second strafed the vessel's crew, and the third shot an aerial torpedo into the hull.

Two soldiers were killed in the attack, which sent the ship aground. The citation mentioned the calmness of the officers and crew, as well as the Army personnel aboard who assisted in fighting a raging fire in the hold.

UNDER RULES AND REGULATIONS similar to those prescribed by the Navy Department, officers and seamen on Merchant Marine ships are now, under authorization of President Truman, to wear the Navy's Philippine Defense Ribbon and the Philippine Liberation Ribbon, if they were members of the crews on vessels when those vessels participated in the defense and liberation operations of the Islands.

THE PORTLAND SHIPPING CLUB held its annual meeting for the election of officers on June 20. The executive committee has elected the following to hold office: George Milnor for president, Dwight Morris for vice president, Lew Fowler for secretary, and Fred O. Meyer for treasurer.

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ELECTRIC MARINE Fuel and Water Level Gauging System



This modern gauging system, which enables the operator to check instontaneously the liquid contained in tanks aboard ship, is of considerable convenience when it is required to shift fuel or water from tank to tank, and is of effective help in the trimming of a ship.

Any number of indicotors may be mounted on a panel to indicate the amount of fuel, lubricating oil, water or other liquids stored aboard ship. The slightest movement of the leverage-type float units installed in the tanks is transmitted electrically to easily read dial indicators. Although extremely sensitive to slight liquid level changes, these gauges are ruggedly constructed to withstand the vibration and shock to which all marine equipment is subjected.

The electrical portion of the transmitter is effectively sealed from contact with the tank liquid by means of a metal sealing bellows. The electric indicators may be located at any distance from the tanks, and the system is not affected by voltage drop.

Other Liquidometer products include Hydraulic Rudder Angle Indicators, Levelometer Hydrostatic Fuel and Water Level Indicators, Liquidometer Hydraulic Marine Type Tank Gauges, Liquidometer Hydraulic Position Indicators, and Levelameter Draft Indicating Instruments.

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MARINE DIVISION

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VAC-REL VENT VALVES

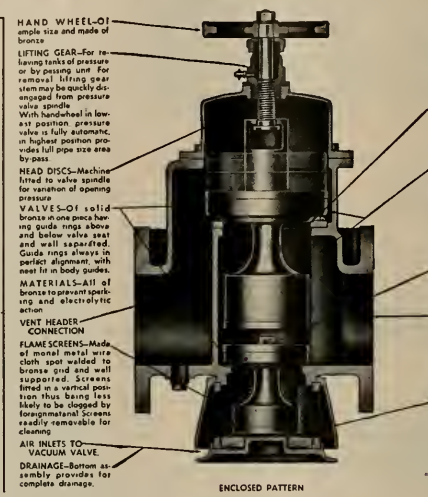
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Losses of the valuable lighter fractions of gasoline during water transportation cost the petroleum industry hundreds of thousands of dollars every year. The VAC-REL Vent Valve for oil-cargo tanks of tankships gives the maximum possible waste-saving by preventing excessive evaporation and reducing losses to a minimum.

Not only are thousands of VAC-REL valves used on the tanker fleets of the leading oil companies, but they are approved by the U. S. Coast Guard Merchant Marine Inspection; American Bureau of Shipping; Lloyd's Register and the Panama Canal Commission.

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ENCLOSED PATTERN

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SHIPBUILDING NEWS

THE KAISER COMPANY HAS once again made front page news with the announcement June 9 that the company had purchased all physical properties of the Portland ship repair firm of Poole, McGonigle & Jennings. No purchase price was announced, but Edgar Kaiser, general manager of Kaiser Co. and in charge of the transferred properties, stated that no government funds were involved in the outright purchase. All machinery, tools, equipment, and inventory are included in the sale. Officials of both companies stated that no changes in operating personnel were contemplated and that present work in progress for various government agencies would proceed as scheduled. Poole, McGonigle & Jennings have been engaged in ship repair and conversion work since January, 1942, doing extensive and highly important jobs on nearly 350 vessels in three and a half years.

Coincident with this announcement the Portland dock commission issued a report that tentative plans providing for three ship berths, each able to handle ships up to 450 feet in length, are now under consideration at Pier B, Terminal 1. It is at this pier that Poole, McGonigle & Jennings have been doing most of their repair work. Plans call for complete revamping of the pier as well as enlargement. Funds for the improvements will come from the $3,000,000 bond issue voted by Portlanders last fall.

THE COAST GUARD in the last two years has been engaged in the important task of making the turbulent upper Columbia safe for night navigation and will soon start work on a 142-mile stretch between The Dalles and Pasco, building 58 range structures along the swift flowing channel. Accomplishments to date include establishment of 176 range lights and unlighted beacon struc-

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Designed to give the maximum in PERFORMANCE with the minimum amount of the compound. Yet giving a complete cleansing of soot from the boiler. This new soot solvent will do from two to three times the amount of work as the average soot remover.

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PROTECTION *with*

AMERICAN MARINE PAINTS . . .

QUALITY COATINGS
FOR EVERY SURFACE
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for underwater surfaces —

GERMICIDE

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SHIPBUILDING NEWS (Continued)

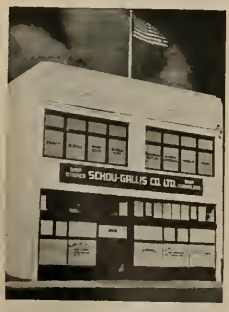
tures, 30 buoys marking concealed rocks and other obstructions to navigation, and three passing lights to aid boat traffic on the river.



PORTLAND HAS TAKEN the first important step to make sure that the port gains its rightful place in the post-war period. Some sixty representatives of industry, shipping, manufacturing, marketing, labor, and public and state agencies have called upon Mayor L. Earl Riley to appoint a committee of government agencies and private interests to "get action before the post-war let-down begins."

In a two-hour discussion of the assets, liabilities, and future needs of Portland as a great world port, it was agreed the chief stumbling block to the port's progress consists of a lack of manufacturers, importers and exporters stationed in Portland.

Chinese naval officers at Todd's Brooklyn yard on an inspection tour of shipyards in the interest of modernizing China's merchant and naval shipping facilities were "greatly impressed." Left to right are: John T. Gilbride, Brooklyn division superintendent of Naval work; Comdr. N. S. Ling, commanding officer of the Chinese Naval Armed Guard; Comdr. Sion-Kwon Lin, assistant attache of Chinese Embassy in Washington, D. C.; Lieut. Comdr. J. H. Flanagon, U. S. Naval Inspector at Todd Brooklyn; Comdr. C. M. Wei, Naval Aide to Generalissimo Chiang Kai-Shek, and Lieut. Comdr. A. B. Field, of Third Naval District Intelligence Office.



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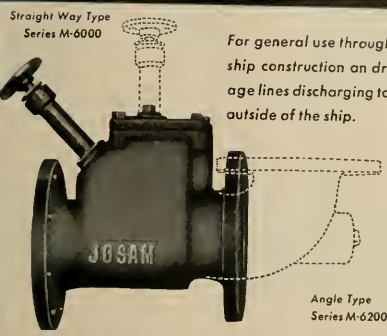
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For general use throughout ship construction an drainage lines discharging ta the outside of the ship.

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VALVE AND FITTING JOBBERS GIVE SUPER SERVICE ON



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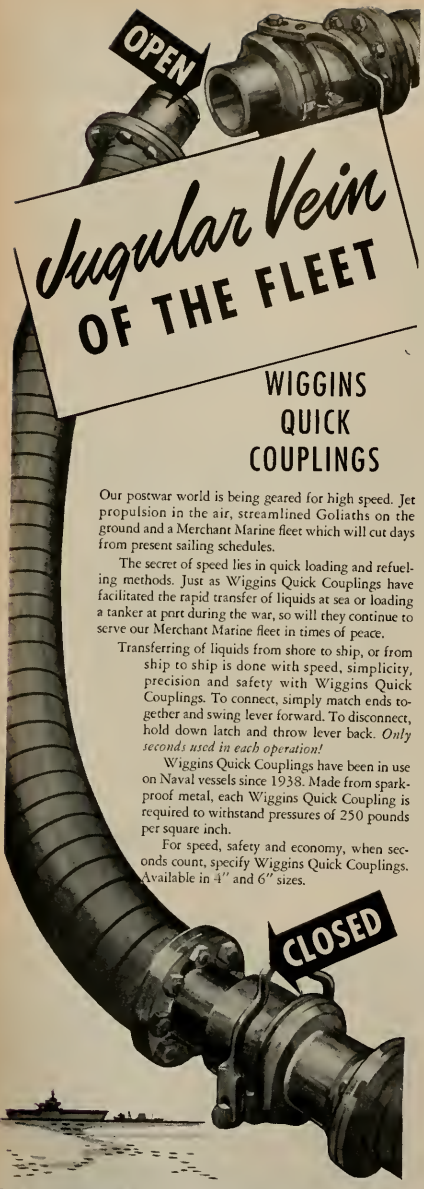
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QUICK
COUPLINGS

Our postwar world is being geared for high speed. Jet propulsion in the air, streamlined Goliaths on the ground and a Merchant Marine fleet which will cut days from present sailing schedules.

The secret of speed lies in quick loading and refueling methods. Just as Wiggins Quick Couplings have facilitated the rapid transfer of liquids at sea or loading a tanker at port during the war, so will they continue to serve our Merchant Marine fleet in times of peace.

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Wiggins Quick Couplings have been in use on Naval vessels since 1938. Made from spark-proof metal, each Wiggins Quick Coupling is required to withstand pressures of 250 pounds per square inch.

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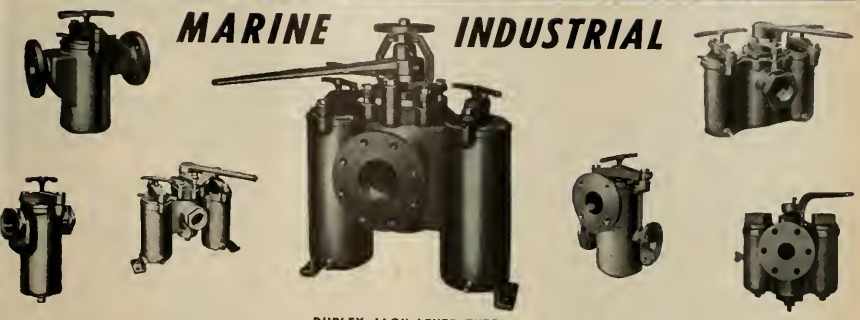
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Shoreside Personalities

Executive Vice President

William A. Elliott, newly elected executive vice president of Elliott Company, is a native of Pittsburgh and received his degree of Bachelor of Science in Electrical Engineering at Penn State, class of 1928.

Mr. Elliott entered the Ridgway plant of Elliott Company following his graduation from Penn State, and

W. A. Elliott, executive vice president, Elliott Co., Jeannette, Pa.





Ronald B. Smith, new vice president in charge of Engineering at Elliott Co.

spent two years in motor and generator design, followed by ten years of sales work in the company's Atlanta, New York, Cincinnati and Chicago offices, being manager of the latter two offices. In 1941 he was made vice president in charge of governmental relations, and became sales vice president in 1943. He is also a member of the Board of Directors of Elliott Company.

General Groninger Heads S. F. Port of Embarkation

Major General Homer M. Groninger, commanding general of the New York Port of Embarkation, recently assumed command of the San Francisco Port of Embarkation.

The Army Service Forces said Major General C. H. Kells, commanding general of the San Francisco Port since June 13, 1944, replaced General Groninger in New York, taking over the job of speeding home-bound armies through that port for redeployment against Japan.

General Groninger went to New York from the Presidio of Monterey in 1940. His command grew to what the Army called "The greatest port of war the world has ever known," a title relinquished to San Francisco in recent months.

In San Francisco he will have under his command the Army piers on the Embarcadero, warehouses and piers at the Oakland Army Base, Fort Mason, Camp Knight, Camp Stoneman, Fort McDowell and a hundred small installations.



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Lidgerwood steering and deck machinery have a long record of reliability, earned on both naval and merchant vessels.



Official U. S. Navy Photograph

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CABLE ADDRESS—BROSITES

Shipping Men in Army Service

Howard D. Hickman, marine superintendent for Key System for 17 years before he entered Army service, was recently promoted to the rank of Lieutenant Colonel in the Transportation Corps, U. S. Army.

Colonel Hickman is in charge of the Marine Repair shops branch of Water Division, San Francisco Port of Embarkation. The branch operates the large marine repair operations at Fort Mason and Oakland Army Base.

Kenneth H. Finnesey, prominent figure in Pacific Coast waterfront activities in peacetime and a member of the Army Transportation Corps since the spring of 1942, was recently promoted to the grade of Lieutenant Colonel in the Army of the United States.

Colonel Finnesey is assistant to the Deputy Port Commander for Operations, Colonel Thomas Plant, at the busy San Francisco Port of Embarkation, Transportation Corps.

In civilian life, he was traffic manager for the Knutsen Line in the Interocean Steamship Corp. setup and affiliated with other prominent steamship companies.

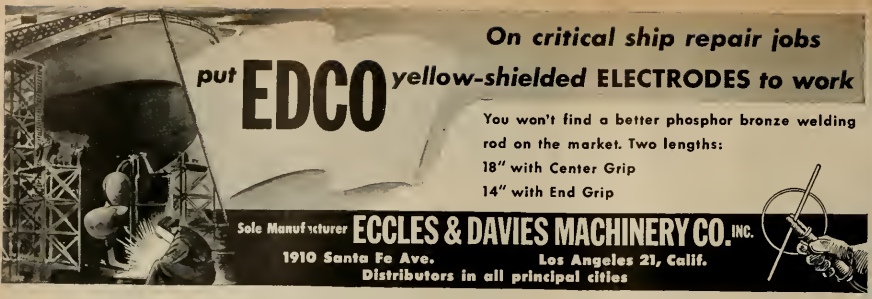
Western Gear Appointments

Thos. J. Bannan, president and general manager of Western Gear Works and Pacific Gear and Tool Works, announced, among other organization changes, the advancement of **Roy Crawshaw** to the position of manager of Engineering and Sales, with headquarters at Seattle in the home office. Mr. Crawshaw was formerly manager of plants in the Los Angeles district.

Other executive assignments were: W. A. Witham as assistant manager of Engineering, and **P. L. Bannan,** the company treasurer, as manager of manufacturing for all plants, with **G. A. DeArmand** his assistant.



Roy Crawshaw, manager of Engineering and Sales, Western Gear Works.



Shoreside Personalities

NEW COMMANDING OFFICER OF T.S.C.G. The Midshipmen Corps of the California Maritime Academy at Vallejo, California, heartily welcomed the new commanding officer, Commander L. Martin, who arrived early in May to take over command of the training ship Golden State.

He has had both Navy and Merchant Marine experience, a man whose life has been spent on the sea. During the First World War he served on the USS Pennsylvania, fleet flagship, for four years, and in 1920, having all the necessary qualifications for a Second Mate's license, he sailed aboard a combination passenger-cargo ship. During his 20 years in the Merchant Marine, Captain Martin has seen service on all types of vessels.

In 1941 Captain Martin left the Merchant Marine for active duty with the Navy. December 7th found Commander Martin in Pearl Harbor aboard the USS Tangier, as navigating officer. He saw active service in the South Pacific for two years, returning in 1943 to put in commission an LSD at Moore Drydock. Commander Martin took part in eight invasions in 15 months while in command of his LSD.

Commander Martin had the admiration from the Cadet Corps even before he came aboard the training ship. He has instigated some new and helpful ideas in regards to the training of the cadets who are under his supervision.



Edward J. Maroney, now sales manager of U. S. Plywood Corp.

New Sales Manager at U. S. Plywood

S. W. Antoville, vice president and director of sales for United States Plywood Corporation, announces that **Edward J. Maroney** has been appointed sales manager of the company.

Mr. Maroney has just returned to the firm after a leave of absence during which he served as a Lieutenant in the U. S. Navy, Production Division, Bureau of Aeronautics.

Prior to entering the service, he was manager of U. S. Plywood's Philadelphia operations. He has been with the company eleven years in its sales department, and previously had been sales manager of Jamestown Veneer & Plywood Corporation.

Briggs Appoints Chief Engineer

Briggs Clarifier Company of Washington, D. C., and Bethesda, Md., has just announced the appointment of George S. Garrard as chief engineer.

Mr. Garrard, who has had wide experience in aviation and industrial engineering, goes to the Briggs post from Jacobs Aircraft Engine Company of Pottstown, Pa., where he was assistant chief engineer in charge of engineering production of Pratt and Whitney aircraft engines. He had formerly been design analyst for the P&W Aircraft Corporation of East Hartford, Conn.

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Photo: Courtesy Stephens Bros. 104' Army Aircraft Rescue Boat.

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Exhibit in L. A. on "How Ships Are Built"

The first exhibit of its kind in the country was opened to the public at the Los Angeles County Museum in Exposition Park on June 17 when Consolidated Steel unveiled its display "How Ships Are Built." Industry and the arts joined forces for the first time in showing, through the use of ship models and dramatic shipyard production photographs, the step by step construction of a huge 13,000-ton C-1 cargo-and-passenger vessel.

A special feature of the opening was a miniature ship launching that took place in a model shipyard constructed in the main gallery of the Los Angeles County Museum.

A series of 126 photographic enlargements, selected from the thousands of construction photographs taken during Consolidated Steel's shipbuilding activities at its eightway Wilmington Shipyard followed the complex construction of a merchant vessel from keel-laying to delivery.

Transparent plastic ship models, as well as exact scale models in steel and wood, were also a feature of the exhibit. In addition, a full-size ship's pilot house, together with all the steering and navigation machinery, was on display, as well as life-size cabins and sections of ships plates.

The purpose of the exhibit is to show the public exactly how the more than half a million parts that go into a ship are actually coordinated, fitted, and installed.

The display is to be continued through July 22.

New Manager Detroit Diesel Sales

The appointment of William C. Gould as sales manager of the Marine Department of Detroit Diesel Engine Division of General Motors Corporation was announced recently by V. C. Genn, general sales manager for the company. Mr. Gould will supervise the distribution and sales of the Series 71 Marine Diesel engine across the country. Prior to January 1st of this year the sale of Detroit Diesel's



William C. Gould, sales manager, Marine Dept., Detroit Diesel Engine Division, G. M. Corp.

Series 71 engine to the marine industry had been handled through the Gray Marine Motor Company.

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Pacific MARINE REVIEW

AUG. 1945



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Actual size of John L. Chaney Clinometer — 12⅜" wide—6¼" deep — curved tube is 16" long and ⅝" in dia.

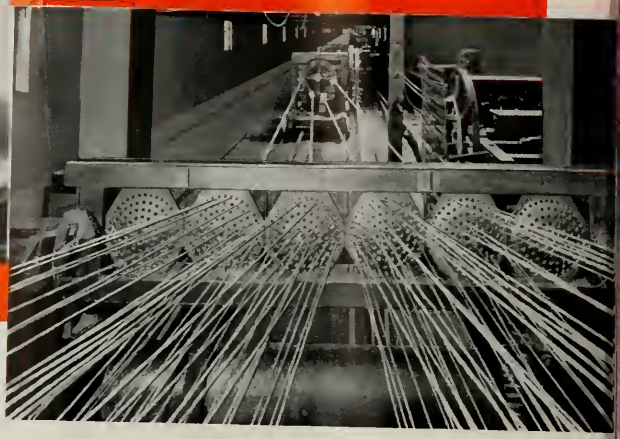
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LAKE GENEVA • WISCONSIN

They BOTH take "Know How"



Right: Looking down the rope walk in the Tubbs Cordage Company Mills.



A mighty salute to the Coast Guard — they certainly have the "Know How" it takes to keep the fighting in the Japs backyard.

It takes plenty of "Know How," too, to make the products to supply the needs of our armed forces. One of the most important of these is rope — and one of the most important steps in rope making is the laying of the rope strand.

In the illustration, you see how this is done by the "rope walk" method — a long, straight pull of the rope yarns in the rope strand assures uniform distribution of strain through every fiber.

It is this sort of "Know How" — acquired by nearly a century of rope making — that has made Tubbs rope the quality leader of the West. When you must replace rope — be sure you specify **Tubbs** to your suppliers.

TUBBS
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Remember this trademark in postwar days — remember NOW to specify TUBBS when rope must be replaced.

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Pacific MARINE REVIEW

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LEXANDER J. DICKIE
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World Trade Editor

. DRYDEN MOORE
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AUL FAULKNER
Pacific Coast Advertising Mgr.
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bscription rates:
year, $1.50; two years, 0; three years, $3.00; for-, $1.00 additional per year; le copies, 25c.

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PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
Offices In: NEW YORK CITY . . . . 16 West 46th Street, Telephone BRyant 9-8436
LOS ANGELES . . . . . 816 West 5th Street, 13. Telephone Michigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 5th.

ROPE and COURAGE

saved the heroic crewmen of the U.S.S. Franklin...



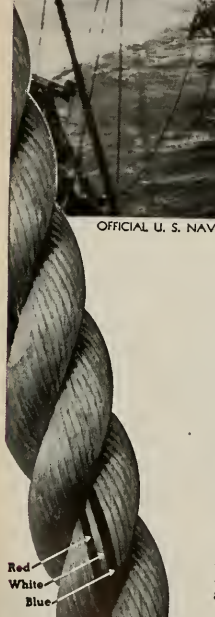
SECOND CLIMAX: With the raging flames under control, the FRANKLIN cuts loose from the cruiser SANTA FE, to strike out again on her own! A crew that wouldn't quit patched up the boilers and engine rooms — and prepared her for that epochal voyage to New York.

OFFICIAL U. S. NAVY PHOTO

● The U.S.S. FRANKLIN, carrier of the *Essex* class—tall as a four story building, three city blocks long —victim of a lucky hit by a single Jap pilot! On the tail of this single strike the floating home of 2500 men was transformed into a blasting, searing hell of flame and anguish. As compartment after compartment erupted its load of flashing death over the heads of its own crew, a saga of naval bravery—of Rope and Courage—in the tradition of American seamen since John Paul Jones—unfolded.

Two-thirds of that great complement of men were pulled from the hungry flames. More than 800 were in the lonely waters of the Pacific at one time—and were hauled to safety on escort vessels—by ROPE! The heroic wounded were moved with grim precision from the holocaust of the FRANKLIN'S flight deck to safety—in slings, made of ROPE.

With the final chapter in this unbelievable tale of man's courage, and devotion to duty, completed by the arrival of the twisted hull in this country, *under her own power*—the story has been told to a people stunned by such superhuman bravery. We of COLUMBIAN ROPE—knowing that this sacrifice was made for us, as citizens, may be proud of the part we played. For Courage was not enough—the heroes of the FRANKLIN also needed ROPE!



COLUMBIAN ROPE COMPANY
400-90 Genesee Street
AUBURN, "The Cordage City," NEW YORK



COLUMBIAN Rope

The Harvard Report

Pacific MARINE REVIEW

Somewhat over a year ago the Federal Government made a contract with Harvard University whereby the latter was to make a study and prepare a report on "The Use and Disposition of Ships and Shipyards After World War II." The actual work on this study was assigned to the Research Division of the Harvard Graduate School of Business Administration. A report on this work has recently been submitted to the Maritime Commission and the Navy Department. Its authors prepared a summary which was published in the Journal of Commerce, New York.

Inasmuch as the House Committee, considering the so-called "Ships Sales" bill, has frequently explained its prolonged holding of this bill as waiting to get this report, it is important that shipowners study the document very carefully. We are therefore presenting in summarized form that part of the report dealing with the disposal of ships. It recommends:

(1) **POLICY.** That as a basic policy the Government should: (a) Sell ships. (b) Avoid delay in selling ships. (c) Fulfill contractual obligations. (d) Refrain as a general rule from operating commercial services. (e) Adopt a "one-price" policy. (f) Make the adopted price policy "firm." (g) Put some ships in reserve and effectively sterilize them.

(2) **PROGRAM.** That, based upon these policies, the Government should adopt the following program:

(A) **SURVEY AND REPAIR.** (1) All ships should be surveyed and those which are obviously unfit should be scrapped immediately. (2) For some ships, the cost of conversion from military use to commercial use will be greater than the price which could be obtained for the ship. Obsolete ships in this category should be scrapped. Good ships in this category that have been declared surplus by the armed forces should be sold immediately to the Reserve Fleet Maintenance Corporation. (3) All ships, except Liberty ships, which are sold to private operators, should be converted from military condition to commercial operating condition. (4) All ships that are sold should be placed in safe operating condition and all war damages should be repaired. (5) The costs of repair and conversion should be paid by the Government, which should arrange for private shipbuilding and ship repair companies to do the work.

(B) **PRICING.** (1) Ships less than 15 years old, except Libertys, should be priced as follows: "basic price" should be established for each type of ship, including important variations of each type. The "basic price" should be the estimated **post-war** reproduction cost in a representative foreign yard. The sales price for each ship should be the "basic price" less depreciation at the rate of 5 per cent per annum from the date of construction. (2) Liberty ships should be priced as follows: The sales price for each and every Liberty ship should be identical. That price should be determined by the Maritime Commission in the light of conditions prevailing at the time of setting the price. There should be no deduction from that price for normal or excessive depreciation. (3) Ships over 15 years old should be priced as follows: The sales price for these ships should be established by appraisal of each individual ship; however, the price should not be less than 20 per cent of the post-war foreign reproduction cost of a similar ship.

(Page 488, please)

The Pacific Horizon

Business and Industrial Activity on the West Coast — Now and Post-War

By T. Orchard Lisle

UNLESS SOME UNFORESEEN and radical change in world affairs occurs, the Pacific Coast is destined to continue its present industrial and business activity for another five to seven years. The Western states unquestionably have entered a period of activity unparalleled in the history of the United States, high lighted by the recent World Peace Conference having been held in San Francisco. No other section of the country has so many visible assurances for the future. Beyond this point man's intellectual vision cannot penetrate.

What are the tangible things which support this statement of fact? The answers are plainly written on the wall in a language everyone can understand!

In the first place the step-up of the war with Japan has resulted in the entire military might and resources of the United States now being concentrated in the Pacific Basin area. Damage and destruction is enormous, and may be even greater before the end. All this damage must be restored.

Foreign Trade

It is up to America to reconstruct the Philippines, replace its damaged harbors, railways, roads, bridges, oil storage plants, mine and sugar equipment, buildings, communications, etc., and provide the population with new transportation equipment. This alone is a tremendous task. Then will follow the reconstruction of the three thousand miles of islands—the Netherlands Indies.

During the first few years after the Japs have been driven out of this vast Dutch colonial area, the international oil industry alone will spend over $300,000,000 in new drilling, pipeline, transportation, refining and marketing equipment, and the rubber and sugar industries there will have to have their machinery and facilities completely replaced, for not much is likely to be left intact after we have swept away the Japs with our fire jets and shells. Rebuilding the many harbors of the islands alone will be a gigantic job; and thousands of town buildings will have to be erected, the larger ones needing constructional steel and piping.

The Dutch cannot supply very much of this equipment for a long time, because Holland first has to be restored to normal, the Nazis having leveled her engineering plants and shipyards. Already American yards are building a substantial fleet of large and small vessels for the Netherlands Indian Government.

China, too, will call for our attention, as America is committed to give aid to her reconstruction in the post-war period. Her potentiality in petroleum, minerals and silk is enormous, and her population will eventually form an attractive market for our own goods. Meanwhile, she badly needs new railways, thousands of miles of good roads, vehicles, diesel engines, boilers, locomotives, machine tools, planes and a host of other items. Perhaps America's biggest task in China will be to help her establish additional and modern manufacturing industries to enable her to capture the large export business enjoyed by Japan prior to Pearl Harbor, which Japan has lost for many generations.

Between the Pacific Coast and South and Central American countries there will come greatly increased two-way trading; the same with Australia, New Zealand and India, and possibly with the Middle East. Inauguration of a 16-knot cargo and passenger service from Coast to Coast through the Panama Canal will shorten by one week the time from New York to San Francisco. This will serve to aid Eastern

The 18,000-ton Navy drydock, largest of its type in Los Angeles Harbor area, at the Todd Shipyard, San Pedro.





Steel floating drydock built at Eureka, California, for U.S. Navy. This type follows the fleet and picks up wounded hulls anywhere. It is equipped for making all ordinary repairs.

manufacturers who cater to the Pacific Coast; in fact, to the entire Pacific Basin area.

The fruit trade—refrigerated-fresh and canned—from the Pacific Coast states to European countries must very greatly increase, apart from augmented production being needed for the United States consumption. Today the United Fruit Company is building a fleet of 15 refrigerated vessels, of which ten are for the West Coast-European service. Destruction of orchards in Europe has been extensive and time is required for the growing of new trees. For five years now Europe has been deficient in fruit diet.

Ship Repair

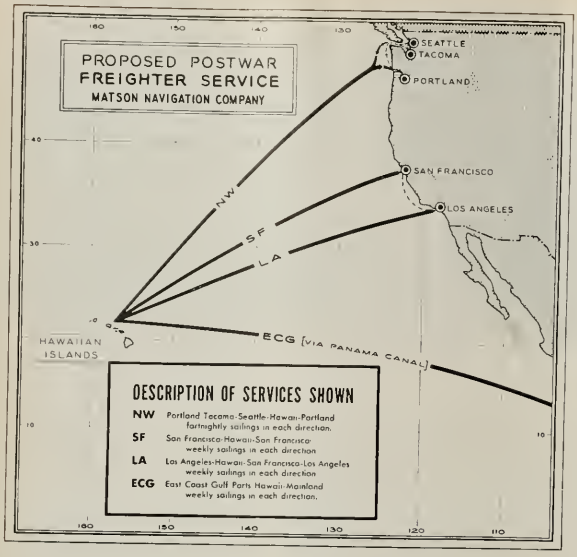
Suicide attacks and bombing of American war and merchant ships have been many, and already the larger West Coast yards are swamped with repair work, which the Navy says will continue for at least one year after the war is over. Meanwhile, the Pacific Coast, having a large number of new yards, is enabled to build quite a few vessels for private and foreign ownership.

The end of the war will signal an extensive ship conversion program, and West Coast yards are likely to benefit greatly because the preponderance of merchant and naval craft are now operating in Pacific waters. Simultaneous with reconversion will come much new shipbuilding, including certain craft special to Pacific coastwise services. It is some years since a ferryboat has been laid down. This also applies to lumber-carrying ships, four of which are now under construction at the Albina yard in Portland, all of which are diesel propelled.

At least 500,000 American troops

Largest marine railway in the world, at Hurley Marine Works, Oakland, California.





and many naval vessels will have to be retained in Japan for one or two decades, which alone will result in considerable transpacific travel and transportation. To enable the expansion of overseas air travel and shipments of goods, a chain of commercial air bases will have to be constructed on key islands in the Pacific area. Each will form a little community in itself, with its stop-over hotel, club, golf-course, power and water plants, commissary, houses for the staff, etc. Also, existing military air bases and naval bases will have to be maintained and supplied from the Pacific Coast.

The Hawaiian Islands will regain their former popularity as a resort as soon as ships and planes are available to carry the traffic, and San Francisco is the main point of embarkation. The pineapple industry—canned and fresh—of the islands is important, and much new machinery will be required. The normal passenger and freight volume is considerable.

Matson Plans for Post-War

The growth expected in the Hawaiian phase of future Pacific Coast business is well illustrated by a recent announcement and map declaring the post-war plans of the Matson Navigation Company, principal ship-operating firm serving those islands.

Matson Navigation Company proposes to dispose of all pre-war freighters, and plans are under way for the acquisition of approximately 20 of the largest, fastest and most advanced type of cargo carriers, especially adapted to the requirements of the Hawaiian trade. Increased size and speed of the new vessels will expand the aggregate carrying capacity to approximately double that of Matson's pre-war fleet.

Four direct routes between the Mainland and Hawaii will be operated, embracing direct weekly sailings from Los Angeles to Hawaii; direct weekly sailings from San Francisco to Hawaii; direct fortnightly sailings from Seattle, Tacoma, and Portland to Hawaii; and, in conjunction with the Isthmian Steamship Company of New York, direct weekly sailings between Hawaii and the Atlantic seaboard, with calls at Gulf ports as cargoes offer. A fleet of new but slower vessels will provide an expanded service for lumber and other heavy cargoes between Pacific Northwest ports and Hawaii.

Augmenting these schedules will be post-war express-cargo and refrigerator services on the de luxe passenger-carrying liners plying weekly from San Francisco and Los Angeles direct to Honolulu.

Schedules for direct freighter voyages from Los Angeles to Hawaii will provide double the sailings, and those from the Pacific Northwest ports will be increased approximately 50 per cent. A total of 130 regular sailings annually in each direction are planned between Hawaii and the five principal Pacific Coast ports.

Speed of the new ships will slash transit time between Hawaii and California ports to 5½ days; between Hawaii and Pacific Northwest ports to 6 days, as compared to 7 to 11 days pre-war; and time on the Hawaii-Atlantic run will be cut from 30 to 17 days.

Each of the new ships in the Pacific Coast service will have 50,000 cubic feet of refrigerator capacity, with the most advanced type of equipment. This will guarantee for Hawaii greatly increased supplies of chilled meats, fish, fruits, vegetables, dairy productions and other perishables which are imported from the Mainland.

Inauguration of the new services is contingent upon release of vessels by the Government for commercial operations.

Special Expansions

Prosperity in Southern California is likely to be assisted by post-war expansion of the movie industry, which has been subjected to many restrictions during the war. The film export trade will doubtless make big strides ahead. While the wartime tempo of the airplane industry on the West Coast cannot be maintained, it undoubtedly will be much greater than before Pearl Harbor.

Resumption of gold mining was recently started in California, and the Pacific Coast mining industry generally needs a great deal of new machinery as well as additional men.

Today there are about two million more people on the Pacific Coast than there were before the war, and it is estimated that the lure of climatic and living conditions will cause half of these to stay permanently, increasing the normal consumer buying locally. Thousands of houses and apartments have to be built for them to take the place of temporary structures and trailers.

Post-War Port Planning

EVERY PACIFIC COAST PORT HAS LARGE IMPROVEMENT PLANS FOR POST-WAR. TYPICAL IS THIS OUTLINE OF SOME MUCH-NEEDED IMPROVEMENTS ON THE WATERFRONTS OF SAN FRANCISCO AS PROPOSED BY THE CITY PLANNING COMMISSION.



Small Diesel Tankers for Asiatic Service

ONE OF THE LATEST ship designs of the United States Maritime Commission is a 12,000-bbls. capacity oil tanker designated as T1-M-BK1. These tankers, of which Joslyn and Ryan, Naval Architects and Marine Engineers of San Francisco, are design agents, are of the usual Forecastle-Bridge-Poop Deck type, with characteristics shown in table herewith. They are of all-welded steel construction, combining longitudinal framing for cargo tanks with transverse framing at the ends. A continuous centerline bulkhead and eight transverse bulkheads divide the ship into one dry cargo hold, a cofferdam and ten cargo oil tanks, with a pump room and machinery space aft.

The Maritime Commission received bids from shipyards all over the nation. The Steel Shipbuilding Division of United Concrete Pipe Corp., Long Beach, Calif., was low with a price of $588,929 per hull. This firm was awarded six hulls, the Avondale Marine Ways, Inc., at Westwego, Louisiana, got six, and the New England Shipbuilding Corp. of South Portland, Maine, are building 12.

The first keel at United Concrete Pipe was laid on May 26, 1945, and all of the vessels are to be delivered before the end of the year. To expedite this early delivery, Joslyn and Ryan have prepared over 400 drawings in less than three months.

The specifications call for the most modern materials and construction developed during the war. All recommended safety measures are employed for both ship and personnel.

These trim ships are designed for coastal service in the Far East, plying the ports from Ceylon to Cathay under the operation of the British Ministry of War Transport. In addition to the usual white officers' quarters, there are ten different crew compartments designed to suit the varying castes and ratings of the Lascar crewmen. Several of these have individual staterooms, such as the Serangs (number one boys), and Tindals (number two boys), while the Cassab (storekeeper) and carpenter bunk together. One Bhandary (engineroom or deck boy) and six seamen are in one compartment and a Bhandary and four firemen in another. The cook shares berthing with a butler, two stewards with a scullion (mess or pot boy), and a spare. Four Seacunnies (quartermasters) are berthed together. The Topas is of such low caste that he sleeps in a rope locker and eats out on the deck some place by himself. Naturally, there must be two galleys, one for Lascars and one for the Europeans, due to the differences in diets and customs. The armed guard also is provided with separate messing and berthing accommodations.

Principal Characteristics

Length O. A.	239′ 9″
Length B. P.	230′ 0″
Length D. W. L.	230′ 0″
Beam	39′ 0″
Draft	13′ 5½″
Depth	15′ 9″
F. L. Displacement	2560 tons
S. H. P.	850
Cargo Cap.	12,000 bbls.
Complement	47 persons

All accommodations and working spaces are mechanically ventilated with fan rooms in the forecastle, atop the midship house and aft of the stack on the boat deck. Cargo tanks are fitted with vents which extend up the masts and terminate with flame-arresting caps.

Abrasive safety treads are used on all inclined ladders and in way of exterior doors. Plastic armor is used around the wheelhouse and all gun platforms for splinter protection. Exterior surfaces in the poop and midship quarters are insulated and lined with sheet metal or marine sheathing.

All lifeboats are of metal with Rottmer releasing gear. Two are 22-foot motorboats with a 25-person capacity, and two are 22-foot oar-propelled type of 31-person capacity. Boats are swung from Landley Crescent davits with hand-operated Landley boat winches.

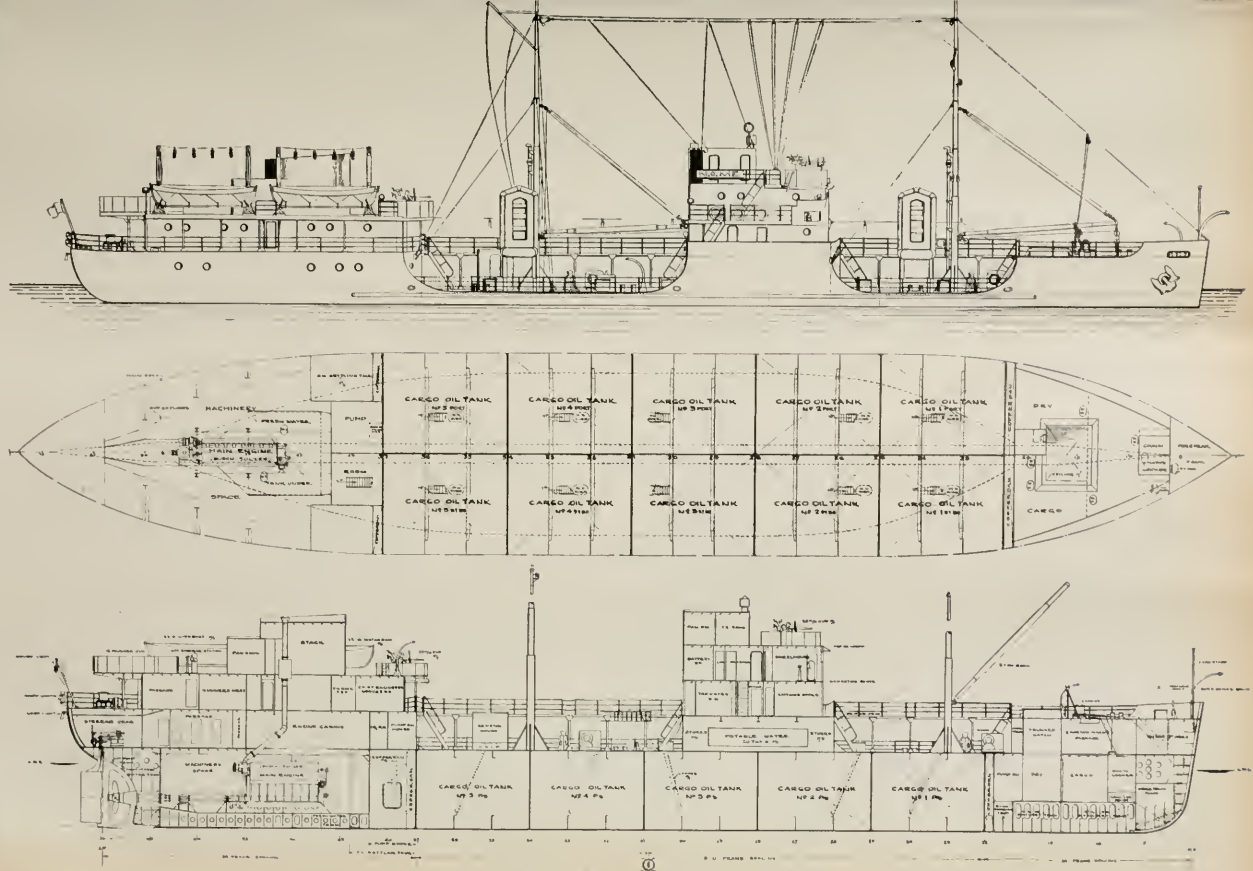
To save valuable space on the forecastle deck, a capstan type anchor windlass is used. Hesse-Ersted of Portland, Ore., suppleid this equipment.

The ship is provided with a three-ton boom on both fore and main masts, which is served by a small Hesse-Ersted cargo winch.

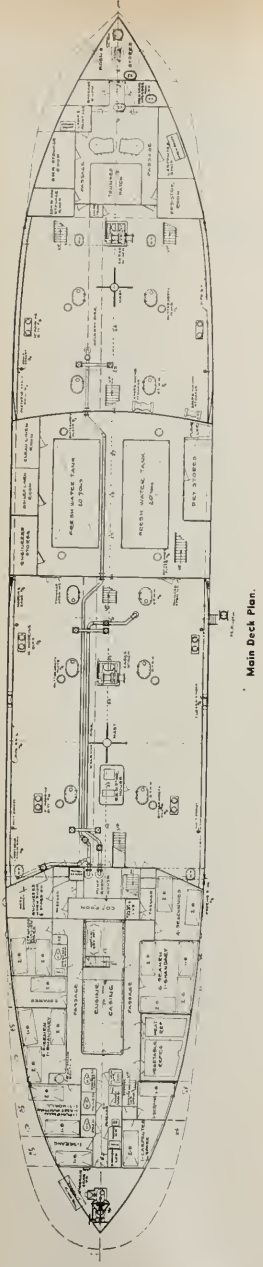
All deck and auxiliary machinery is electric powered from two 150-kw diesel generators. With the Busch-Sulzer main engines the auxiliary power units installed are Lorimer diesel engines driving Allis Chalmers generators. On the ships powered by Nordberg propulsion engines, the auxiliaries are Joshua Hendy diesels driving Crocker-Wheeler generators.

Main propulsion engines are direct connected diesels, developing 850 shp at 300 rpm. Busch-Sulzer and Nordberg share in supplying these units.

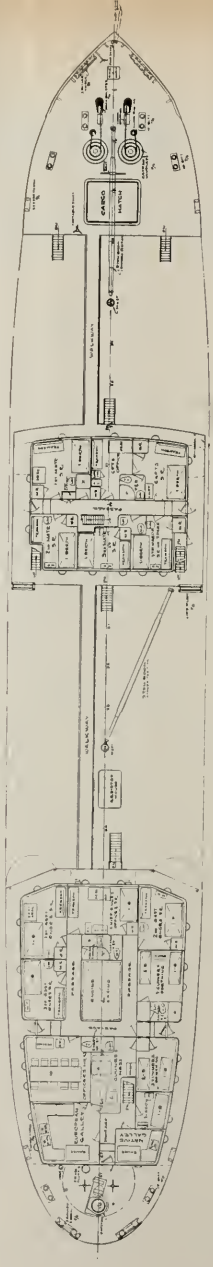
These main propulsion units are all



Outboard Profile, Hold Plan, and Inboard Profile T1-M-BK1



Main Deck Plan.



Poop Deck, Bridge Deck and Forecastle Deck Plans.

4-cycle, single acting, mechanical injection, direct reversing with attached Buchi type, exhaust gas driven, turbo supercharger. The Nordberg engines have six cylinders with 16-inch bore and 22-inch stroke. The Busch-Sulzer engines have eight cylinders with 13-inch bore and 20-inch stroke

Both makes of engine use the fresh water cooling system with heat exchangers using salt water to cool the fresh water. Ross heat exchangers are used with the Nordberg engines, and Graham Mfg. Co. exchangers are used on the Busch-Sulzer diesels.

Starting air at 250 psi is supplied in each vessel by one motor drive compressor and one standby diesel engine drive compressor, each of Worthington make and of 20 cfm free air capacity.

A Heilman water tube boiler of 1500 p.h. capacity is installed to provide steam for heating quarters and cargo tanks.

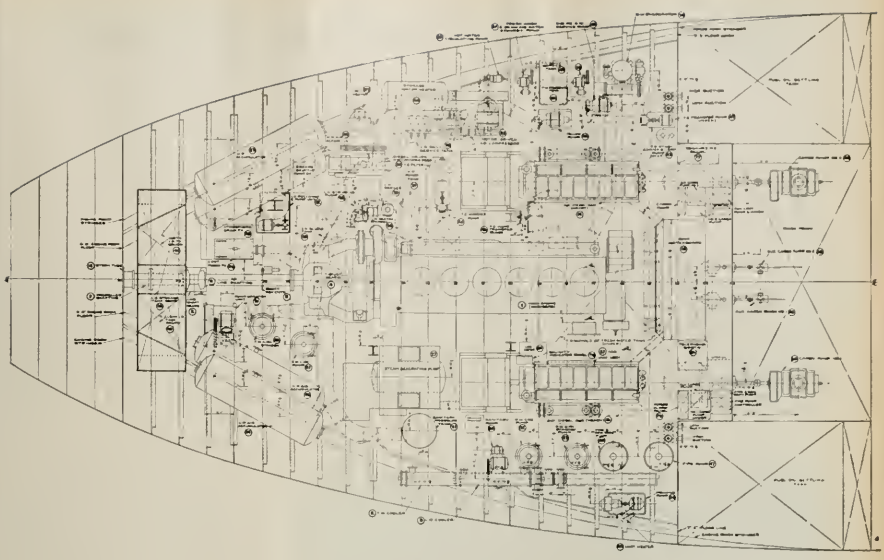
Refrigeration of ship's stores is provided by a Carrier Corporation "Packaged Unit."

Two 25-kw motor generators take care of all lighting requirements, while a 2½-kva DC/AC motor generator set operates the intercommunication system.

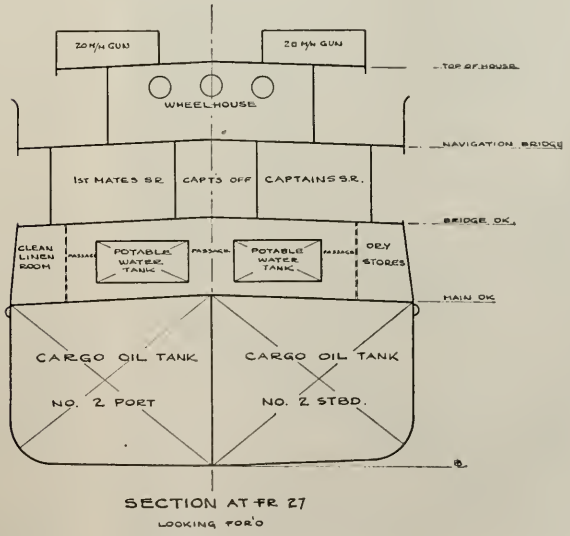
The liquid cargo will be discharged by two main pumps, each driven by a 60-hp motor, with a maximum rate of 1020 bbls. per hour through six-inch connections.

The cargo piping is arranged so that any cargo tank may be discharged independently. There are hose connections on each side forward of the bridge, at midship aft of the bridge house and just forward of the poop house, with one six-inch line extending along the poop deck so as to discharge over the stern.

There are no special stripping pumps provided, but a pair of 1½-hp Quimby pumps connected with a two-inch line to each tank furnish auxiliary cargo pumping facilities and are useful to discharge small quantities of cargo.



Machinery Arrangement Plan.



SECTION AT FR 27
LOOKING FOR'D

Technical Illustration Methods

Pertaining to the Shipbuilding Industry

By Cyril P. Hubert

This article characterizes the manner in which Chief Engineer W. C. Ryan and his associates lay out a blueprint in picture-story simplicity in order that "Calship" field workers may visualize requirements in definite perspective.

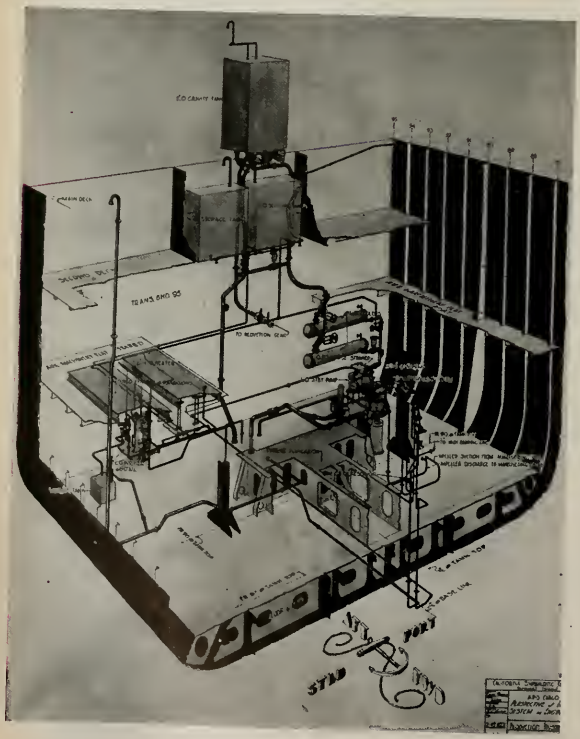
ALTHOUGH the shipbuilding industry's new records of war-speed construction have been emblazoned in the printed news as akin to the miraculous, the growth of the shipbuilder's handiwork, the real ingenuity of attainment in simplifying production, can only be realized by a study of the inherent features of the fabricating techniques as they fit into the integrated scheme of production. Everyone has been stirred by the magnificent achievements, all at the accelerated tempo of war. As Henry Seidel Canby recently stated, "There is an aristocracy in this country not of privilege, not of wealth, but of brains and ability."

One of the prime requisites in any unitized shipbuilding program is industrial illustration, which presents in a factual manner the overall production picture. The setting up of current standards of design and fabrication and the imparting of such information in a manner apropos of "Don't tell it, show it," emanates from the drafting board. Integrated design is the joint responsibility of the design and production staffs if these agencies are to secure intelligent, unified personnel effort in the task of expanding industrial productivity. In the final analysis, it is the efficiency of the over-all development itself that counts.

The Premise

Since most persons new to the industry are apt to experience difficulty in visualizing and associating several plane views of a design unit, as a practical matter, it became necessary to proceed on the assumption that engineering drawings must be simply presented in order that the non-skilled and semi-skilled run-of-the-mill employees could readily understand them.

It is impossible, in this brief pic-



Perspective of lube oil system in engine room, VC2-S-AP3 cargo ships.

(The author is Chief Loftsman, California Shipbuilding Corporation, Terminal Island, California.)

torial narration, to give more than a suggestion of the range of technical illustration. The subject matter chosen gives an illuminating insight into how the California Shipbuilding Corporation's objectives and techniques are made crystal clear to the workman.

There has been no greater boon to craftsmen and keymen alike, during this period of great emergency, than the instructional value of the professional delineator's dramatizations of modern methods of shipbuilding. In conforming with this reality, the immediate issue was to provide perspective interpictation of the conditions that impose themselves with regard to mass production techniques. Toward this end, basic technical illustration cites the combination of all the elements that make up the complete assembly.

So much for the background of the picture.

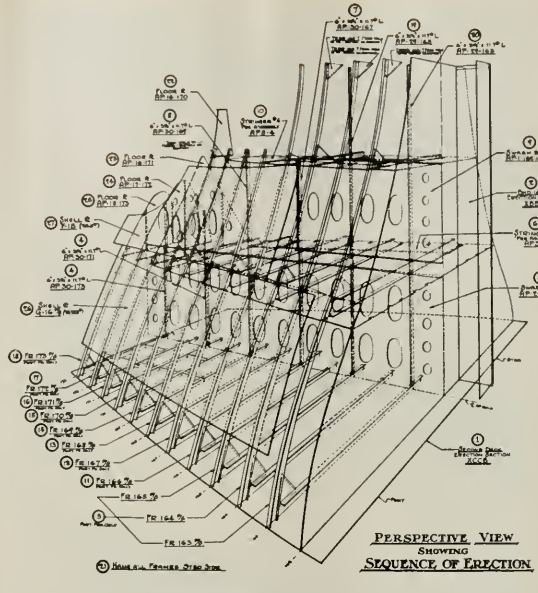
The Basic Framework

For industrial illustration to be truly effective, it must cover the whole of the structural program. With this viewpoint in mind, it is perfectly understandable that the most common sense method of approach is that of incorporating perspective drawings supplementary to design details on the same sheet as an assembly aid in interpreting the engineering blueprints.

The second plate reproduced herewith represents a case study in the assembly of component units indicative of the main and secondary operations to be performed along with the proper sequence of subassembly. Such step-by-step delineations give the craftsmen guidance as to the correct procedure to follow. These illustrations typify the primer-like approach, bringing into sharp relief essential standardized modern production techniques.

The Pedagogical Value

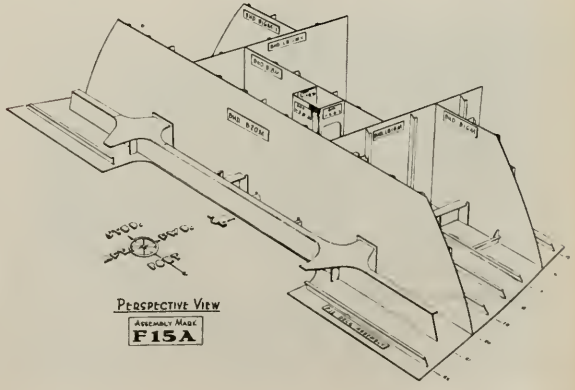
In logical sequence, pictorial presentation of production is importantly related to the "training-within-industry" program. It is a major motivating factor in taking the mystery out of advanced ideas of production. The great influx of unskilled labor, to be effectively trained, constituted a problem. Unskilled labor adds nothing to production except cost. The pedagogical utility of technical illustration opened up new interests and planted in the mind of the rank

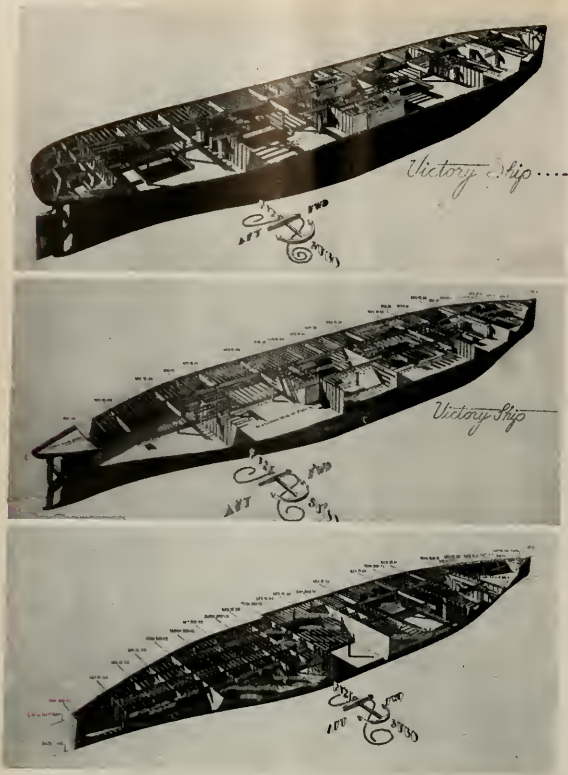


An assembly job illustration, didactic in effect, of how framed connections are viewed in their individual significance, each in its balanced interrelationship.

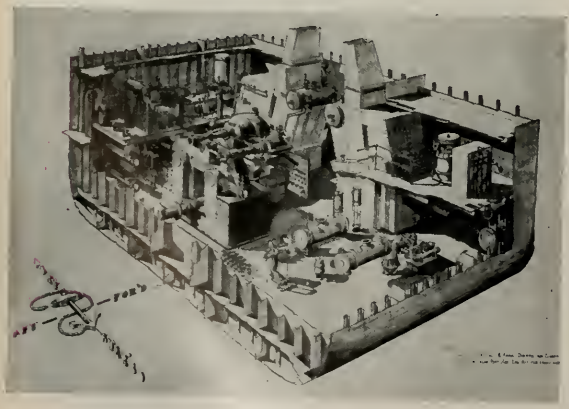
and file worker an effective picture of construction procedure. Such picturization not only helped to produce self-reliant and progressive journeymen with rounded skill but also served as a touchstone of reference for the seasoned, experienced craftsmen by breaking down job operations and showing the steps involved. This is the broad premise that has

A mathematically accurate perspective sketch of the complete deck assembly for identification of parts in the assembly.





Above: VC2-S-AP3 cargo ship. Perspective cutaways of (1) tank top, (2) first platform deck and (3) second deck.



This pen picture of the engine room of the VC2-S-AP2 cargo ship reflects the progressive trend in production illustration modernity. View from port, looking forward.

activated the "Calship" engineering staffs.

The total concept of Chief Engineer W. C. Ryan's plan of operations was to bring to the fore the most practical exposition of modern streamlined techniques. To evaluate these influences properly necessitated a well-thought-out framework of company standards for smooth functioning of production. Thinking in terms of production along simplication lines is essential to today's production goal. The experienced fieldman's point of view was given due consideration in ironing out construction kinks while the plans were in the tentative stage. Consequently, to visualize the successive stages of design and construction in producing an instrumental drawing, it frequently became advantageous to prepare preliminary illustrations to facilitate decision which would offset interdepartmental friction during actual construction.

Manner of Stylizing

Various types of perspective illustrations are used extensively to supplement and amplify engineering drawings. These include: functional (system) illustrations depicting piping diagrams; sectional perspective illustrations taking the form of line perspectives with indicated cross-sectional views; phantom and exploded assembly views; production illustrations of pre- and subassemblies; and group and installation assemblies. In this connection pictorial presentations of the various phases of ship construction were portrayed in true three-point perspective by the aid of either especially prepared perspective drawing boards or perspective paper indicators or charts. Since most draftsmen have only a superficial acquaintance with the basic fundamentals of the professional illustrators' art, these contrivances enabled them to make mathematically accurate renderings wherein the layout of the perspective pictures was reduced to a merely mechanical operation.

In making up perspective charts convergent lines are obtained by establishing distant vanishing points and station points in such a manner that the picture plane is placed in front of the object with the object

situated below the horizon so that it can be viewed from above. In using this perspective indicator, there are no vanishing points to construct and no auxiliary lines to draw. The delineator can readily project any set of measurements into correct perspective to any desired scale within the boundary of the perspective paper and without the customary laborious procedure. The perspective guide lines are easily visible through the tracing cloth.

A similar consideration applies to the use of the perspective drafting board and tangent-square. The working edge of the "T" square is positioned equidistant between the working points of the "T" square attachment. This combination of tangent-square and perspective board of circular arc formation is effective in drawing any object in perspective, since converging lines can easily be drawn toward their respective vanishing points outside the limits of the drawing.

The accompanying three-dimensional visuals are a representative cross-section of the types of ink-pen portraits used at "Calship" in interpreting engineering drawings. This correlated series of studies of the many phases of construction typifies the production technique that underlies the total concept in providing "ready information."



Production illustration showing "exploded" assembly of basic component parts at a glance and their relative placement in the completed hull structure.

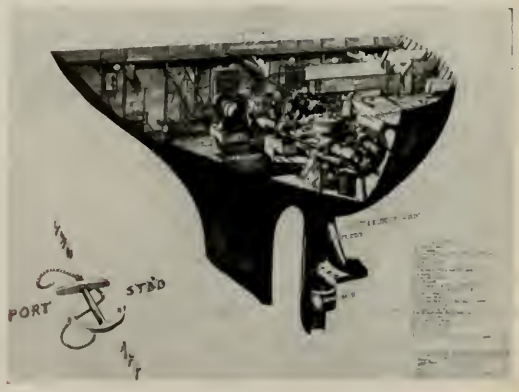
High-light events of the past four years indicate that technical illustration supplementing and complementing detailed plans speeds production by outlining work programs and procedures.

Technical illustration as a tool in the imparting of information becomes a vitally important element because it:

(a) provides the nuclei for giving a good deal of lift to the unseasoned workers;

(b) provides the skilled worker with endless apposite methods in the effective performance of his job;

(Page 488, please)



Perspective of steering gear compartment, VC2-S-AP2 cargo ship.

Concrete Floating Machine Shops

By K. M. Walker

CULMINATING the concrete ship construction program at the plant of the Concrete Ship Constructors, National City, California, are the big, elaborately fitted floating machine shops "FMS 1" and "FMS 2." The first, builder's hull No. 48, has been delivered to the Navy and is somewhere in the Pacific. The second, hull No. 49, was scheduled for delivery on May 1.

The hulls are constructed of reinforced concrete, including the raised forecastle, main and forecastle decks. The main and upper deck houses are of steel. The hulls are 265 feet long, 48 feet beam and 17 feet depth, with two full-length fore and aft bulkheads of concrete spaced 10 feet apart to create a system of "voids" down the center line of the ship, which is used to carry piping and power cables. Concrete transverse bulkheads divide the space below decks into 10 holds, five on each side of the voids, which are used to store tools and spare parts in steel bins and lockers, except that the Number 1 hold on the port side is fitted for refrigerated galley stores and the Number 1 starboard hold contains the ammunition magazine and additional galley stores.

The reinforced concrete hull has 8" thickness of shell, 7" decks and 6½"-thick bulkheads.

The upper deck house is devoted to crew accommodation, with quarters for six officers and 117 men. The officers' ward room is in the forward end of the upper deck house and is served from the galley below by a dumbwaiter.

The crew's messroom and galley is contained in the forward end of the main deck house, while the rest of the main deck house is given over to machine shop, electric shop, motor testing shop, precision instrument room and generator room, all of which are spacious and well lighted and fitted with forced air ventilation.

The generator room contains a pair of 5-cylinder, 150-hp, 8" x 10½" Type B-B-5 Worthington diesel engines direct coupled to two 100-kw 440-volt Westinghouse alternating current generators. A motor generator is used to convert A.C. current to D.C. for the windlass and other deck machinery, but all other machines and power tools are A.C. drive.

A neat, fully enclosed switchboard supplied by Westinghouse takes up almost the full width of the generator room.

All power tools are driven by individual motors, and belting is limited to that required on any particular machine.

Over the main deck house immediately abaft the upper deck house a steel "A" frame is mounted to support a 30-ton Jumbo boom to handle large motors or other material for repair and to lift the steel power-driven landing barge carried on the top of the main deck house, which is to be used for general work and personnel service and can be used to move the ship short distances in protected waters. The vessel is also armed for protection in event of air raid.

U. S. Navy FMS 2 at outfitting dock, Concrete Ship Constructors, National City, California.



ON THE FACING PAGE:

Upper left: Main generator room. Upper right: Main switchboard in generator room.

Center left: Shaper and drill press section, main machine shop. Center right: Lathe section, main machine shop.

Lower left: Precision instrument room, looking forward.

Lower right: Part of 25,000 part storage bins in holds.








Aluminum Alloys For Marine Construction

By David MacIntyre

THE NEED OF America's post-war merchant marine for ships that can be operated efficiently invites consideration of the use of lightweight construction materials. Among light materials suitable for shipbuilding purposes aluminum and its alloys have probably been the most studied. Although the use of this light metal on ships is not new, it has been only recently that aluminum has found general acceptance for marine structural purposes.

There were several reasons why the shipbuilding and shipping industries did not, in the past, turn more readily to a greater use of aluminum. One such reason is the understandable caution of industries upon whose excellence of design, production and operation the safety of life at sea depends. It is not without a great deal of thought and research that shipbuilders are content to depart from commonly accepted and satisfactory practices.

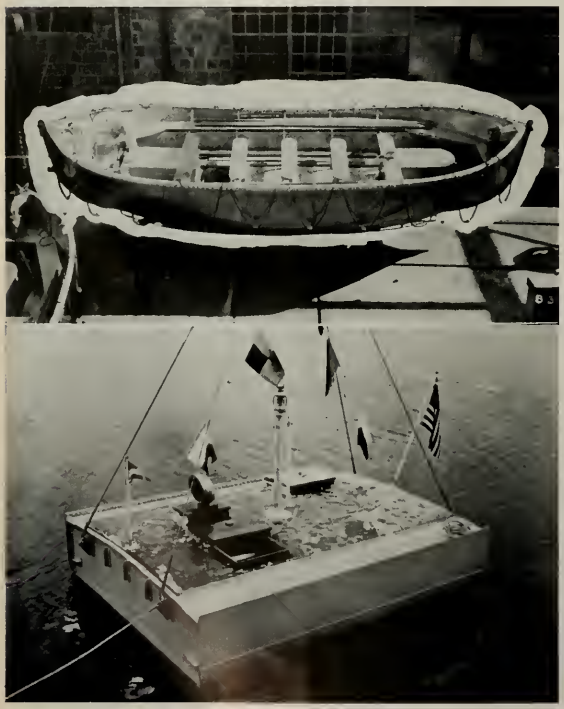
Another reason, and incidentally the one primarily of interest to the aluminum industry, was the erroneous impression that aluminum's resistance to salt water corrosion was so poor that its use for marine purposes could not be justified. This conviction, essentially the result of improper practices in the early employment of aluminum for marine construction, has been gradually dispelled during the past 15 years largely through the good service record of aluminum alloys on ships of the U. S. Navy.

Before discussing the present and contemplated applications of Alcoa aluminum to marine construction, it may be well to consider in some detail the task of research and development in this field, and the results that have been achieved.

For many years the Aluminum Company of America conducted salt water exposure tests on small specimens of various aluminum alloys. These tests definitely indicated the seaworthiness of the metal, but it was felt by all concerned that a test more nearly representative of actual service conditions was necessary before aluminum would achieve real recognition by naval architects and shipbuilders.

Any such test, to accomplish its purpose, would have to answer two major questions: (1) Is aluminum's resistance to salt water corrosion sufficient to permit its successful use in the construction of ship's hulls and superstructures? (2) Can aluminum, when used for marine purposes, be

Upper: This aluminum lifeboat, similar to those used on the Nieuw Amsterdam, weighs only 3100 lbs., compared to 4650 lbs. for the same unit in steel.
Lower: A general view of the Alumette at her moorings at Newport News, Va.



(The author is a marine development engineer, Aluminum Company of America.)

as easily fabricated as other shipbuilding materials?

Each of these questions was naturally of interest to both the aluminum and shipbuilding industries. The latter, however, was particularly interested in the second question, and wanted to know whether—if aluminum became a tonnage possibility in marine construction—any new fabricating techniques would be involved which would necessitate the training of a large number of workers.

Pondering these questions, the company decided that the only thing to do was to build a vessel which would be representative of up-to-date construction, and which could be given tests of some duration under sea service conditions. Accordingly, after a plan prepared by W. Starling Burgess, noted naval architect, the Bath Iron Works Corporation constructed for Alcoa a suitable vessel built entirely of Alcoa aluminum alloys and christened the Alumette.

For the purposes of this test the construction of a full-sized ship would have been desirable, but inasmuch as the successful use of aluminum in ship construction is not a matter of strength—some of its alloys have greater strength than mild steel—but of corrosion resistance and fabrication problems, it was considered that a hull section would suffice.

In keeping with the purpose of the experiment, the Alumette was fabricated entirely within the plant of the Bath Iron Works Corporation by the regular shipyard crews, without recourse to special tools or processes. Plates and shapes were sheared, punched, and formed on the same equipment used for the steel going into the construction of two destroyers, which were then on the ways at the yards. The experience of the fabricators of the Alumette indicates that the problems attendant on marine construction with aluminum alloys are comparatively minor in nature, and no great obstacle to the metal's use.

The latest inspection of the Alumette was made in May, 1945. This was the thirteenth such inspection in the nine and one-half years during which tests have been going on. Its condition at that time was exceptionally good, and outside of cleaning and painting the deck and hull, there was no necessity for other maintenance. The U. S. Navy Bureau of Ships, the U. S. Maritime Commission, the U. S. Coast Guard, the U. S. Bureau of Standards, and many shipbuilding companies have been following this test closely, and all are expressing satisfaction with aluminum's performance. In agreement with the results that have been obtained from the exposure of small test specimens, it was found that wrought and cast alloys of the aluminum-magnesium type are highly resistant to sea water and entirely suitable for the construction of ship's hulls. Furthermore, these alloys are unaffected by any known type of marine growth, although all types adhere readily and firmly to surfaces that are not protected by anti-fouling paint.



Section of grille taken from S. S. Mauretania when she was dismantled in 1935. This aluminum application was exposed to salt air for over 27 years.

Augmenting the Aluminum Company of America's planned program of marine research is the information gained from the practical application of aluminum to marine construction. As early as 1895 an aluminum alloy torpedo boat was built for the French Navy, and because of its light weight was considerably faster than similar steel hulled vessels. A similar boat, the Sokol, constructed for the Russian Navy at about the

British pleasure yacht Diana II, launched in 1931. The 55-foot vessel had an aluminum hull, aluminum decks, bulkheads, davits and railings.





The U. S. Navy has made extensive use of aluminum in the construction of naval craft. This interior view of the Aircraft Carrier U. S. S. Yorktown shows aluminum partition bulkheads, doors, lighting fixtures, chairs, table trim, side boards, and transom seats in the wardroom. Through the use of lightweight aluminum in construction, it is possible to increase the armament of warships without increasing overall tonnage. This vessel was sunk in 1942 in the battle of Midway.

same time, had aluminum hull plates and superstructure and was the speediest vessel of its type. In our own Navy, much of the superstructure of several torpedo boats, commissioned at about the turn of the century, was built of aluminum alloys. Many of the yachts which engaged in America's cup contests had substantial amounts of aluminum used in their construction, notably for masts, spars and booms.

In these early applications, the aluminum used ranged from commercially pure aluminum to those alloys containing copper or zinc as the principal agent. The latter alloys are considerably stronger than pure aluminum but are definitely lower in resistance to corrosion. For this reason, some early marine applications of aluminum were not particularly successful. The development of alloys containing magnesium, or magnesium and silicon, which are highly resistant to salt water exposure, completely altered the situation, and opened the path to more widespread use of aluminum for marine purposes.

Despite the lack of success of some early marine uses of aluminum, most of them have rendered outstanding service, and have been the source of much vital information. Many of these original installations were, it is true, of a non-structural character, but they were exposed to salt air and clearly demonstrated the innate resistance of aluminum to saline corrosion.

One of many examples was the first S. S. Mauritania. This vessel, which was in active service from 1907 to 1934, was equipped with aluminum grilles around the elevator and the purser's office. When the ship was dismantled, the grilles were found to be in excellent condition, completely unharmed by the salt atmosphere to which they had been exposed for 27 years.

The evolution within the past 15 or 20 years of strong, corrosion-resistant aluminum alloys containing magnesium and silicon increased the extent to which aluminum could be structurally employed for marine purposes. A recent outstanding example of such an application is the aluminum alloy bulkheads in the passenger quarters of the S. S. Normandie. Another instance of the structural use of suitable aluminum alloys for marine purposes is the Canadian patrol boat Interceptor. Built in 1934, for service in the Gulf of St. Lawrence, this vessel has given a good account of herself. The Diama II, a 55-ft. pleasure cruiser launched in 1931, has an aluminum hull, decks, bulkheads, davits and railings, and presages the future all-aluminum boat.

Details of many of the recent and contemplated applications of Alcoa aluminum alloys in ship construction are cloaked by military security. It is possible, however, to divulge sufficient general information to convey some idea of the progress aluminum has made in the marine field. Of particular interest are the aluminum alloy lifeboats, davits and winches which have been built or ordered during the past year. Facilitating the lowering of topside weight, their large-scale adoption is evidence of the success of past development work. Prior to the war there were about 70 such lifeboats in service, the largest user being the Nieuw Amsterdam, flagship of the Holland-American Line.

Other structural marine applications of aluminum alloys include smokestack enclosures and stack houses. Several vessels to be so equipped are now being built; others have already been completed and are in service.

An ambitious project, contemplated for the near future, is the equipping of a number of large American passenger vessels with extensive two-deck aluminum superstructures. Each vessel will involve about 150 tons of aluminum alloy, which represents the largest structural application of aluminum to merchant ships that has ever been made. It will mark a notable advance in naval architecture and the art of shipbuilding.

In addition, these vessels are to be equipped with aluminum lifeboats, davits and winches. Aluminum accommodation ladders, airports, side lights and windows will be used throughout the superstructure. Aluminum bulkheads are to be installed, and passenger cabins and public rooms will be finished with aluminum furniture and decorations.

This planned construction represents the advance of aluminum in marine construction to date. It is not difficult, however, to envision post-war fleets of large passenger liners, even more extensively equipped with aluminum — eventually, no doubt, with aluminum hulls—and achieving the ultimate in modernity, efficiency and comfort.

New Refrigeration For USS Relief

By Herb Southworth

DURING THE RECENT lay-up of the Navy Hospital Ship Relief for general repairs it was decided to rehabilitate the refrigeration system and to make some changes in the machinery and in the arrangement of some of the refrigerated spaces. The major space change was in that space devoted to the carrying of frozen foods. The existing boxes were completely torn out and two new boxes built with anteroom common to both. In the arrangement of these spaces every effort was made to use a maximum of space with a minimum of loss due to door location and bulkhead arrangement and construction.

The existing machinery consisted of two 75-hp CO_2 compressors rated at 12 tons each, shell and coil-brine coolers and brine circulating pumps. The brine system was what is nominally called a closed system with supply and return branches to each refrigerated space but no separation of circuits to the various compartments so that brine temperature changes or amount of brine flowing in each of the circuits could be observed. The principal reason for the changes was that with the vessel operating largely in tropical waters the existing CO_2 system was inadequate to maintain the required temperature in the refrigerated spaces and there had been food losses due to this cause.

New System

All the refrigeration is installed aft of the engine room between watertight bulkheads at frames 125 and 133. The machinery is located on the first platform along with chill-stores spaces for dairy products, ice maker and green vegetables. The meat and frozen food spaces are located on the second platform and occupy the full space except for access ladder and elevator space. The biological storage and mortuary are in the lower hold. The temperatures range from 45° F. in one chill space to 0° F. in meat and frozen food storage spaces.

The design temperature and coil arrangement were based on circulating −10° brine and a −18° suction to compressors.

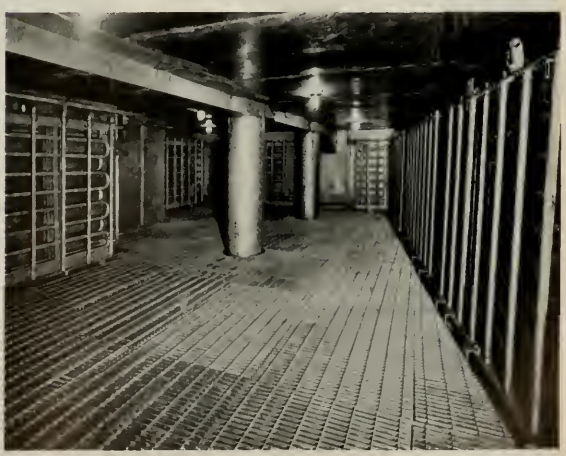
New Equipment

The new equipment consisted of two 20-hp Freon compressors, 2 Navy-type Freon condensers, 2 special shell and tube multi-pass brine coolers, 2 liquid heat-exchangers incorporated in brine cooler construction, 1 shell and tube brine heater, two 5-hp brine circulating pumps, 1 warm brine circulating pump and open brine return tank.

Compressors are conventional reciprocating machines, belt-driven by 20-hp motors and designed to use Freon (F12) refrigerant. Condensers are Navy specification shell-and-tube non-ferrous construction. Brine coolers are of all steel construction with tubes welded in. The suction from brine coolers is through dual connections from each end of the cooler and through the liquid heat-exchanger to the compressor. The liquid heat exchanger serves a double purpose, that of superheating the suction gases and of sub-cooling the liquid Freon before it passes through the expansion valve. This procedure greatly increases the efficiency of the refrigeration cycle in many ways. First by superheating the suction gases it creates a better compressor operating condition and eliminates possibility of slugs of liquid gas carrying over to the compressor with the resulting danger to compressor valves, pistons, and cylinder heads. This is a safety feature of first importance. The second important fea-

(Page 460, please)

One of the cold storage spaces on the U. S. S. Relief after reconversion.



(The author is chief engineer, George E. Swett & Co., Engineers.)

The New Pacific Coastwise Lumber Carrier

FOR OVER THREE-QUARTERS of a century much lumber has been moved by water from the Oregon and Washington ports south to California, for local use or for export. This trade in early days produced sailing schooners especially adapted to its use on this coast. It also produced a peculiar brand of very efficient sailors to operate these schooners. Later on the same type of hull was provided with a power plant aft and became a "steam schooner."

On one or two occasions in the early years of this century special types of steel lumber carriers were designed to facilitate the loading, transport and unloading of lumber. Notable among these was the C. A. Smith type, with holds especially designed to take Ross Carrier loads on pallets and with terminals at each end of her run equipped with special dock and cranes to unload such lumber packages.

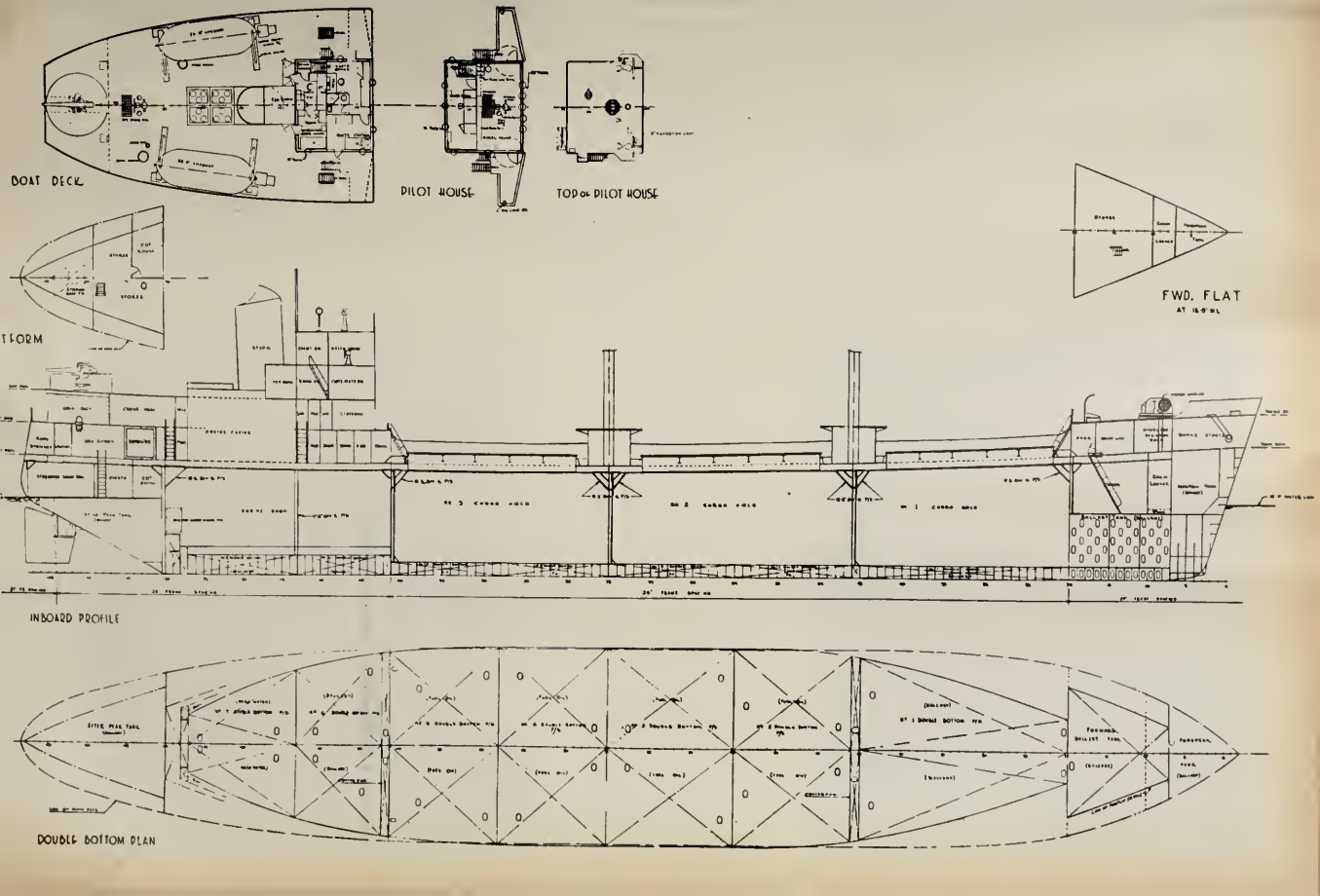
Now comes L. R. Hussa, president Albina Engine and Machine Works of Portland, Oregon, a qualified expert in lumber handling and in naval architecture, with a very sensible and practical new design for this lumber service. This design has the approval of the United States Maritime Commission and of the American Bureau of Shipping. A contract to build four of the type was awarded Albina Engine and Machine Works, and the first of these four is in the water and will shortly be ready for her trial runs.

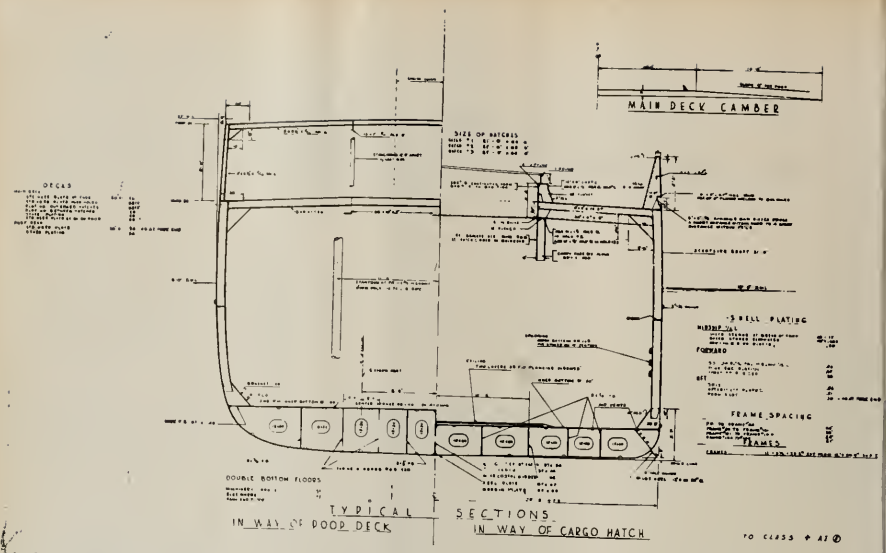
The Hussa design is based on experience in a trade which has many peculiar factors affecting the design. Among these are: carriers must be designed to handle their own loading at many different points; maneuverability must be great to enable carrier to negotiate narrow, crooked channels leading to some loading points; lumber distribution experience indicates that two and a half million feet of lumber is approximately the economic maximum, and a considerable proportion of total capacity must be carried on deck.

To meet these conditions Mr. Hussa designed a hull with a load

Left: View from the poop deck, looking over the unique deck and hatch arrangement. A million board feet of lumber can be carried on deck, a million and a half in the holds. Right: The number two hold from the port side of the deck. The hatch is 21' x 45' 6". The hold is approximately 22' in depth. Note absence of 'tween decks to facilitate handling of cargo. Double bottoms for bulk fuel oil ballast extend the length of the three holds.




BOAT DECK
PILOT HOUSE
TOP OF PILOT HOUSE
FWD. FLAT
AT 16'-0" WL
INBOARD PROFILE
DOUBLE BOTTOM PLAN



draft of 18 feet; with twin screws driven by diesel engines of ample power to drive the hull at 12 knots; with deck capacity for a million board feet; and with large hatches served by great winch power and long, sturdy booms.

The principal characteristics are shown in table herewith:

Length O. A.	319′ 0″
Length W. L.	309′ 0″
Beam	49′ 0″
Depth	26′ 0″
Draft	18′ 0″
Ht. Deck Load	12′ 0″
Power Propulsion	2400 shp
Speed Est.	12 knots
Displacement Ld.	5600 tons
Dead wt. capacity	3820 tons
Lumber cap.	2,250,000 F.B.M.

As will be noted in the profile, the design has a raked bow and a modified cruiser stern. All crew quarters and the navigating bridge are in the poop superstructure and the machinery space is directly below, thus leaving the main deck and the holds for almost the entire parallel middle body open for lumber stowage. There is no 'tween deck. The three large lumber holds are served by three large hatches. Hatches No. 1 and No. 3 are 21 feet wide by 43 feet 4 inches long. Hatch No. 2 is 21 feet by 45 feet. There are practically no columns in the hold space.

An interesting item in the design is the large forepeak tank. One of the problems in the Pacific Coast lumber carrying trades is the return northward in a comparatively light condition. For a large part of the year this northerly trip bucks a stiff northwest breeze that kicks up a nasty head sea. Filling the large forepeak tank with sea water levels off the trim sufficiently to eliminate dangerous pitching. For the same reason the bottom plating under No. 1 hold and the forepeak has extra thickness.

Comfortable quarters of fireproof construction are installed in the poop with ample sanitary, culinary, ventilation and refrigeration equipment to take care of a crew of 47, including the present gun crew. In post-war operation there will be room for from 12 to 16 passengers.

Modern navigation equipment in the pilot house includes: Sperry gyro compass and course recorder; Submarine Signal Company indicating and recording fathometer; and a Mackay radio direction finder and radio equipment.

Gravity davits equipped with boat winches to handle the two 26-foot motor-propelled lifeboats were furnished by Lane Life Boat and Davit Corporation.

Deck Machinery

As shown on the drawings herewith two masts are installed, each of which has a pair of 70′-long booms fore and aft. Thus the central hatch is double gaged and the forward and after hatches are single gaged. The gear is designed so that each boom and its winch will handle a four-ton load. Winches are American Hoist and Derrick, single speed Model A-75M, and are each driven by a 50-hp Westinghouse motor. These winches are installed on the top of the resistor housings 9 feet above deck level.

The windlass and a warping capstan were supplied by Webster-Brinkley of Seattle and are driven by General Electric motors of 35 and 10 hp, respectively. Two bower anchors of 5110 lbs each, from U. S. Steel Corp., and two 135-fathom lengths of 1 1/4-inch anchor chain, from the Pacific Chain Company, comprise the ground tackle.

The Matthews Variable Voltage type steering gear, manufactured by the Marine Electric Company of Portland, Ore., is installed to take care of the rudder. The control of this gear works on the Ward Leonard system of variable voltage control, and the steering motor is energized through a constantly operating motor-generator set. Complete control of the steering gear motor, from

zero to full speed ahead or reverse, is effected through varying the field current of the generator.

All propeller struts, rudder and stern frames, stern tubes, and many miscellaneous castings are cast steel, furnished by Columbia Steel Castings Company, Portland, Ore.

Power Plant

Main propulsion machinery consists of two 8-cylinder 16″ x 20″ four-cycle directly reversible Union diesel engines, each rated 1200 shp at 280 rpm. These engines are each equipped with an Elliot-Buchi exhaust gas turbo supercharger, and were built by the Union Diesel Engine Co., Oakland, Calif. Each engine drives a single piece tail shaft through a Kingsbury thrust bearing. The stern support on each shaft is a Goodrich cutless rubber bearing. Propellers are right and left hand, Doran 3-bladed screws, 93 inches diameter and 68 inches pitch. All control functions for both engines are centralized at a common control station in the engine room.

Engine room pumps are in general Buffalo Pump Company centrifugals, driven by Louis Allis Company motors, and include: a fire pump and a fire and general purpose pump, each driven by a 40-hp motor; a fuel oil transfer pump with a 15-hp motor drive; two sea water circulating pumps and a sanitary pump, each with a 10-hp motor drive; and three fresh water circulating pumps, each driven by a 7½-hp motor.

A 10 tons of fresh water per day capacity Davis Engineering Company evaporator takes care of culinary and make-up cooling and feedwater needs. Two York Freon-12 compressors serve the ship's stores refrigeration boxes to a total of 750 cu. ft. capacity.

Steam for heating quarters and for culinary purposes is provided by a Clayton steam generator of 2500-pound capacity.

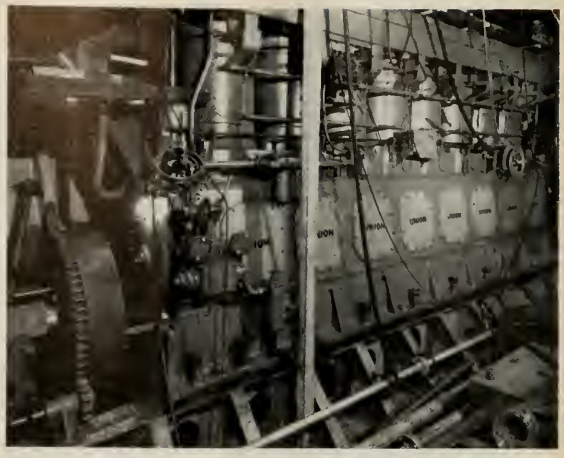
Auxiliary Power

Electric power for deck and engine room auxiliaries is furnished by three diesel generating sets, each of 90 kw capacity, and one 15-kw emergency set. The three auxiliaries each consist of a Worthington five-cylinder 8″ bore and 10½″ stroke four-cycle full diesel rated 135 shp at 600 rpm.

Each of these engines drives a three-wire 120-240 volt dc Elliott generator rated 90 kw. One generating set supplies all cruising demands. Two will handle normal cargo handling demands. The third set is a standby. The emergency set is a Hill four-cylinder diesel driving a 15-kw General Electric dc 120-240-volt generator, hooked up to start automatically by battery when main generator voltage fails.

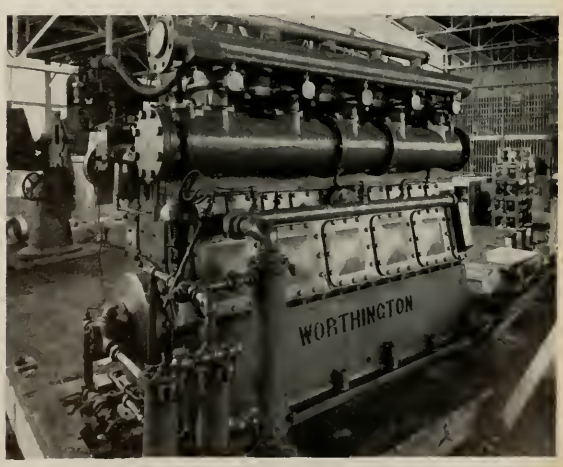
The main and auxiliary diesels are served by two Honan-Crane lube-oil purifiers and two De Laval fuel oil purifiers.

Those familiar with the design and equipment of Pacific Coast lumber carriers will readily recognize the tremendous advance made by Mr. Hussa and the Maritime Commission in bringing out this new type. Names for the four ships have been designated as Oregon Fir, Arizona Pine, California Redwood, and Washington Cedar.



Propulsion machinery is powered by two 8-cylinder Union diesel engines of 1200 hp each.

Worthington diesel for auxiliary generating set.



NEW REFRIGERATION FOR USS RELIEF

(Continued from page 455)

ture improves the thermal and mechanical efficiency of the equipment. This is accomplished by sub-cooling the entering liquid gas. The heat absorbed from the entering liquid by the suction gas is a net gain in thermal content of entering liquid as the heat lost by liquid is taken up by suction gas after all work of absorption from brine has been completed. This action might be compared to heat recovery of stack gas in the uptakes from a boiler. Sub-cooling entering liquid ahead of expansion valve greatly reduces the amount of flash gas and this heat recovery greatly reduces the amount of work to be done by the compressor.

Control

The use of brine circulation in refrigeration greatly reduces the number of controls required for operation of the plant. As there is only one low-pressure evaporator, which in this case is the "brine cooler," a set of controls is required for each circuit and in the case of large refrigerated spaces several circuits are required. To enumerate briefly the comparative controls, those required for brine are (1) constant-pressure-expansion valve to control evaporating pressure, (2) a thermostat to control brine temperature by starting and stopping the compressor, (3) high pressure switch to protect the system against excessive pressures that might be caused by water failure to condenser. Box temperatures are controlled by manual operation of standard gate valves in the brine lines supplying the various refrigerated spaces. Once the brine setting is made very little adjustment is required. Controls for direct expansion systems are one thermal expansion valve for each circuit; in the case of the subject job 14 circuits would be required, 10 thermostats, 10 solenoid valves, 5 suction-pressure control valves and high- and low-pressure control on the compressor, or a total of 39 controls compared with 3 in the brine circulating system as used on this ship.

Reliability

In the brine system all high-pressure piping or refrigerant piping is confined to a small space in the ice-machine room where a close check can be kept on its condition and if leaks develop the search for them is confined to a small space instead of throughout all the refrigerated spaces and inter-connecting piping. Because Freon (F12) is an odorless gas and leaks can be detected only by a flame test it is possible for all the refrigerant to escape before a leaky condition is noticed and then comes the tedious job of locating and repairing.

On marine installations where repair facilities are limited to the ship's equipment and additional refrigerant is also limited to ship's supply, the simplifying of the refrigerant piping is of primary importance.

Efficiency

Due to the reduced suction pressure in the brine system to maintain the same relative conditions in the refrigerated spaces the volumetric efficiency of the compressor will fall off approximately 10%, the horsepower loss will be approximately 28%, or a total loss of approximately 38%. At first glance this appears to be an excessive loss but when reduced to dollars and cents and all factors of safety to cargo and cost of upkeep considered it can be looked upon in a much more favorable light. On a vessel with a modern power plant the fuel consumption will run between 0.6 lb. and 0.7 lb. of fuel per horsepower hour. We can assume a fuel increase of .266 lb. per hr. per hp applied to the subject job where under full load the total power consumption averaged approximately 20 hp, and we arrive at an increased fuel use of 5.3 lbs. per hour, or based on $1.00 per bbl fuel oil approximately 45c per day. Considering the increased safety to cargo and stores and the service cost attendant to the upkeep and maintenance of a complicated direct expansion job this seems trivial. The writer's observations over years of experience indicate that simplification of equipment, reduced cost of upkeep and great reliability are the points to strive for.

The above installation was made under the direction of the Assistant Industrial Manager's Office of U. S. Navy; Geo. E. Swett & Co., engineers; consultants; General Engineering & Dry Dock Co., prime contractors: Armstrong Cork Corp. built insulated spaces and applied pipe covering.

Pacific Coast Representation

Some time ago we had occasion to comment on the disproportionate representation that the Pacific Coast has on Congressional committees. It is not a new experience for the West, and probably every line of business and every section of the country has felt, at one time or another, that it was being discriminated against in some manner. The Pacific Coast has taken the lead, however, in so many important undertakings that it seems that more credit should be given.

In the foreign trade and shipping world the contributions of the West are outstanding. We are thinking of the reciprocal trade treaties, the waterfront employers' organization, foreign trade banking—all matters in which the West pioneered.

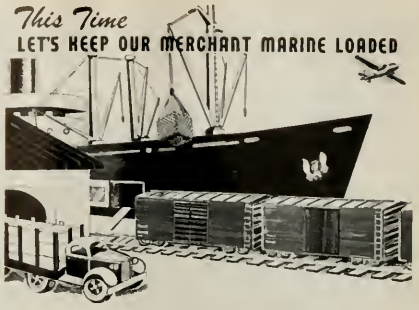
Now comes the election of directors of the National Foreign Trade Council. There are 52 directors, new and holdover. More than half of these (29) are from New York. The Pacific Coast has four and the Gulf Coast has three. Head offices of some of the world's important steamship lines are in San Francisco, and the same is true of insurance companies, but only one of them is represented on the Foreign Trade Council. Are they not in foreign trade?

There are likely to be foreign trade and shipping matters wherein Western interests will need protection. For instance, the routing of import cargo, freight rates, subsidies, canal tolls. The West should see that it has fair representation on every board and committee.

BOOK REVIEW

Marine Coppersmithing, by Frank J. Carr (McGraw-Hill Book Company, Inc. $2.00). This book outlines the many possibilities for efficient, streamlined design, light weight and savings of materials to be found in the use of copper for line and fittings. It should prove of definite value not only to coppersmiths, but to engineers and designers.

Pacific WORLD TRADE



By T. Douglas MacMullen

WANTED: Technical Men

Opportunities For Military And Shipyard Technicians

World trade is too often thought of in terms of money, or tonnage at the ports, and too seldom in terms of people.

Of course, people handle ships and shipments; people produce the goods and people make markets. There are tourists who develop exchange balances, salesmen, and those who finance and those who insure.

Students

In our May issue, we published a synopsis of replies from U. S. colleges to questions regarding their plans for increasing emphasis on shipping and world trade. Few of the answers made any reference to training men or women for foreign service.

Most world countries will be thinking of industrialization and higher standards generally, with more roads, bridges, railroads, hospitals, factories and mines. Also better ports, airports, and ship and plane repair and service facilities.

With much of the industrial capacity of Germany and Japan permanently throttled, the opportunities in those countries for technicians will be sharply curtailed and there will be many of them seeking places abroad. The openings which world reconstruction and world trade will provide for returning military men and for many of the technical staff of war plants should be listed and explained so that all may see. Our railroad, power and irrigation specialists, engineers, teachers, doctors, and trade experts should be ready with language, customs, and other training so they may compete in foreign fields.

China

The need for technical people in China is and will be so great that it will tax the educational facilities of the world. A recent estimate by Dr. Chu Chia-hwa, China's Minister of Education, places the minimum requirement at 2,500,000. China is trying to meet the need with its 145 universities, colleges and technical institutions, where there are 1,100,000 students enrolled — an average of over 7500 students to a college—but cannot hope to catch up in either number of graduates or quality of training. An inkling of the kind of problems faced in China may be found in the providing of necessary books for students. They must be on many subjects and in the appropriate language. Their purchase must be financed, and they must be transported through enemy lines. Probably all of the students in all of the colleges of the Unied States could find instant employment in China alone, and this probably applies also to the engineers, draftsmen accountants, economists, doctors and other professional people in all of our war plants.

Among our millions of returning service men and boys — many with the necessary training and many more wondering what courses to undertake—there will be great numbers who can serve themselves and the cause of world trade if steps are taken now by the colleges and others to sell them the idea.

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NEXT MONTH

Rehabilitating the World's Machinery

Business Progress in Philippines

China's Efforts Toward Education

Central America

"Europe Will Decline, While the Pacific Shores and Islands Will Become the Chief Theater of Events in the World's Great Hereafter." —*William H. Seward (In the U. S. Senate in 1852)*



Yuba dredge No. 86 (tin), operated in Malaya from 1930 until Jap invasion.

California-Built Dredges for Export

By Herbert A. Sawin

Sales Engineer, Yuba Manufacturing Company

Most travelers in the great valley of California sooner or later become aware of one of the leading industries of the state, placer gold dredging. Few know, however, that this method of producing new wealth grew, in California, from an idea imported late in the last century from New Zealand. From a small start it was expanded and developed by men of more than ordinary mechanical ability, touched by that finger of fate which gives the prospector and gold miner a generous share of optimism and the courage to keep trying. That old urge to keep on digging, "colors are sure to show in the next pan of gravel," guided dredgemen in their effort to lick the mechanical problems inherent in attempts to dig gold-bearing gravel from great depths and to recover bits of placer gold from ground worth only a relatively few cents per cubic yard. (Since 1898, gravel dredged in California has averaged only $0.12 per cubic yard.)

Herbert A. Sawin



Success with California type dredges, developed largely by the Yuba Manufacturing Company and its predecessors, naturally led to questions concerning their use abroad. Yuba dredges have been built for export and used in placer fields of many countries since 1912. Not until after World War I, however, did the demand come, to any large extent, from outside the Western states, Alaska and Canada. Many dredges in Malaya, even in recent years, are of old design and of low capacity. About 1920 tin dredging interests in Malaya and platinum miners in Russia began looking toward the gold dredging methods in California. Since then, Yuba has shipped, to remote areas, many dredges and much equipment to modernize old dredges. Every placer deposit presents its own peculiar problems. The prospecting work indicates most of them, but the experience and ideas of field men must be combined with sound engineering practice to produce the right dredge for any given area.

Since Dame Nature seldom was so thoughtful in forming placer deposits as she was in California, where placer gold is found in paying quantities adjacent to rail and highway routes, the problem of transporting dredge parts to the field is a major one. Yuba-built dredges and parts have been exported from California to Alaska, Yukon Territory, Malaya, Portugal, Russia, Korea, the Philippines and South American countries. Strength and long life are paramount; low-value gravels can be dredged profitably only by maintaining high operating time and constant production. Machinery and structural members, including hulls, must be so designed as to permit shipment in con-

Pacific World Trade

venient sizes and assembly in the field without sacrificing strength and wearing qualities. Measurement penalties can be avoided usually by proper nesting and bundling. Small units and fittings must be in boxes made of strong lumber (at least 1" thick, preferably thicker for many parts) and strapped with steel. Boxes must have strength to stand rough handling and dropping. Crates for machinery must be well designed and reinforced with steel straps. Much dredging equipment shipped abroad reaches its destination by man power alone, and this point should be considered in determining the sizes of individual boxes and pieces. Electrical and other parts must be protected against tropical conditions and moisture.

Hull and structural steel can be prefabricated, but the pieces must be of a size readily handled by the most inefficient method encountered en route. Yuba shipped steel members and machinery for dredges for transport by air 15 years ago, working to specifications furnished by its customer. Height and length of individual pieces for transportation were carefully planned in advance. Such limits often are the controlling factors in engineering and designing a dredge for delivery by air, as was the case in New Guinea. Engineers of Bulolo Gold Dredging Ltd. spent months in designing their dredges, which were flown, piece by piece, from the beach at Lae to interior dredging fields. Experience gained during the war, transporting heavy materials by air, and large cargo planes of the future will undoutedly encourage development of remote placer fields requiring dredges designed for air transport.

We have heard much about the use, by the Navy, of pontoon-type equipment. Yuba dredges have been built with separate small watertight hull pontoons since 1933. These are used successfully on many dredges, and have been shipped to Alaska as deck loads. The pontoons are set up and ready for assembly in the field by bolting. In one case, they were landed on a beach with about 1500 tons of machinery and hauled by tractor and trailer equipment 20 miles along the beach and a river bed to destination. Yuba builds a knocked-down type pontoon, for shipment abroad, which avoids measurement penalties. It is readily assembled in the field by welding and bolting.

Dredge hulls, complete with superstructure, have been erected with machinery and dredging equipment in place at Gulf points, for delivery to Colombia, South America, by tow-

(Continued on page 474)



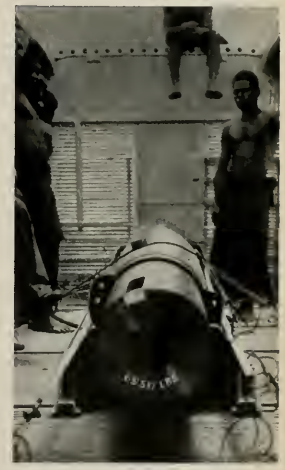
Top of page: Pontoons shipped to Alaska and later assembled in the field.
(Photo by Dudley, Seattle)

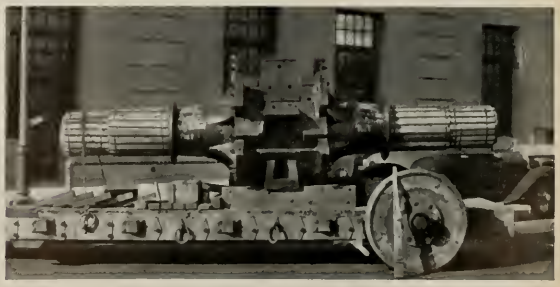
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Center: Tumbler shaft as loaded in a plane for shipment from Lae, New Guinea, to interior dredging fields. Weight 6950 lbs.

●

Bottom: Yuba upper tumbler prepared for shipment. Weight of such pieces is sometimes as much as 20 tons, and special provision must be made for handling.





Netherlands Indies Prospects

What Shall We Find After Liberation?

With the liberation of the Netherlands East Indies in sight the attention of the shipping world is being directed more and more to that rich part of the world. Holland is already buying and building ships for her Indies routes and for inter-island trade, and many engineers and architects from American shipyards and other war plants are rumored to be inquiring about opportunities in the rebuilding of devastated industries. Other suggestions on this subject are mentioned on page 461 of this issue.—Ed.

In a recent publication of the Netherlands Chamber of Commerce at New York, several unofficial suggestions are offered that are of interest to shippers and traders.

First, in answer to the question as to what will be found in the Indies after liberation, it is stated that the main export products of the Indies, in the order of their importance on the American market, are as follows:

Rubber	Pepper
Tea	Petroleum Products
Tin, Tin Ore	Hides and Skins
Palm Oil	Resins
Tapioca	Essential Oils
Hard Fibers	Coffee
Kapok	

Generally speaking, it is believed that the Japanese attitude towards sources of raw materials has been one of conservation and protection rather than one of indiscriminate or willful destruction. The Japs wanted to conquer these territories in order to acquire political and economic power and also to create a Pan-Asiatic economic autarchy. It is unlikely, therefore, that they have up to now neglected or destroyed the assets found in the occupied countries which they intended to exploit in the future.

People have often theorized that because Japan's metal shortage was very great, she would ship to Japan all factory equipment not urgently needed in the Indies. However, Japan will abandon the idea of winning the war only at the very last moment. She intended to effect her economic recovery by selling Netherlands Indies products to the world as soon as possible after the war, and this would be possible only if she kept all sources of produce in good condition, which involves the upkeep of estates and the maintenance of processing equipment. Furthermore, the metal Japan might derive from scrapped factories in the Indies would be negligible in comparison with her total needs. It would seem, therefore, that we may find part of the produce-processing plants in reasonably good condition. This assumption is more or less supported by reports from the Indies which lead us to believe that Japan has set up a large centralized organization for the purpose of coordinating the maintenance of plantations, estates, etc.

Pacific World Trade

When Japan knows that she is about to lose the war—and the Indies in particular—she may make an attempt to destroy the processing plants. However, all those who must perform the destruction, whether they be Japanese soldiers or civilians or whether they be Indonesians, will know that the end has come. Since this will have a highly demoralizing effect on all parties involved, it is believed that such a military order will be postponed by the Japs until the very last moment, and possibly until it is too late.

It is also improbable that the estates, or planted areas, will be destroyed, because of a lack of Japanese man power to carry out extensive damage, and the Indonesians will be the last to cooperate in the destruction of one of their most important sources of income in the nast and their only hope for an early recovery from the miseries of war.

There is reason to be optimistic about the possibility of finding quantities of produce at the time of liberation. Let us bear in mind that several agricultural raw materials produced in the Indies are also grown in the Philippines, Thailand and Indo-China. Japan with her shipping shortage will have acquired a good deal of such raw materials from these countries rather than from the farther away Indies. Rubber, for instance, could be obtained in sufficient quantities from Indo-China and Thailand; copra, sugar, and fibers could have been obtained from the nearby Philippines. It is quite possible that stocks of such products for which Japan has no immediate need are accumulating in the Indies, especially since the liberation of the Philippines is rapidly tending to isolate the Indies.

Then, we must remember that several agricultural raw materials are grown partly or exclusively by natives. As Japanese currency has no buying power, these native growers will have sold to the Japs only when forced to and in small quantities. They may have discontinued production to some extent, or in such cases where this is hardly possible (pepper and kapok), they may have hidden a good deal of their goods. For example, there may be quantities of pepper, which will stand long storage without deterioration, and we may also find stocks of resins, essential oils, coffee, kapok, rubber and copra.

Brief comments on the specific products follow:

Strategic Materials

Rubber—There is a fair chance of finding stocks of rubber, although it would be impossible to make conjectures about the quantities. The rubber reconstruction department for the Netherlands Indies developed plans for the earliest possible resumption of production. The equipment for the first six months after liberation has

been purchased in the United States and is expected to be sent overseas during 1945 to distributing centers as near the rubber areas as possible. Rubber is a strategic material of the first importance, and the efforts of the Netherlands Indies Government are mostly concentrated on this product, as it will be an important contribution to the Allied warfare.

Fats and Oils—It is believed that a lot of copra can be obtained immediately after liberation. Little is known about the palm oil estates in Sumatra and elsewhere, but we may apply to them the ideas outlined in the general discussion above.

Hard Fibers—We know little about the hard fiber situation, but it would seem likely that the Japs would promote cultivation rather than otherwise.

Kapok—Kapok is for the greater part produced by natives. We may expect limited quantities at the time of liberation, but it is believed that Japan needs this commodity badly for her navy.

Resins—Resins are classified as a strategic raw material from the Japanese point of view, but it is doubtful whether production has been maintained on a pre-war level. We know that in some parts of New Guinea tapping has been completely discontinued.

Hides and Skins—Hides and skins will have been collected by the Japs as much as possible. There are signs indicating that livestock has been thoroughly reduced by the occupation forces.

Non-Strategic Materials

Tea—A limited production may have been continued. It is possible that the outlying estates have been neglected, but those within easy reach of the economic authority of the Japs have probably been given a reasonable amount of upkeep.

Pepper—We may expect stocks, although it is likely that production has been reduced because of lack of fertilizers and man power and the general emphasis on the growing of food crops.

Coffee—There have been rumors broadcast by the Japs that some coffee estates have been partly converted for food production. However, a good deal of coffee is grown on very small plantations owned by natives, and it is doubtful that many of these small holdings have suffered from the war.

Essential Oils—Production has probably been neglected.

In closing, we should like to stress that we are rather on the optimistic side with regard to the future, and we firmly believe that the resumption of produce exports from the Indies will take place fairly soon after liberation, provided we can obtain the necessary means of transportation.

The above article contains no official statements or expressions of opinions but is a general and informal voicing of our ideas based on reliable information received from inside sources.

Borneo

The progress of the allied armies in Borneo has been rapid. Reports as this is written indicate that the petroleum plants around Balikpapan on the east coast were not too seriously damaged and are already in partial production for MacArthur's forces.

Dutch Shipping

The major industry of Holland is shipping. The Netherlands Chamber of Commerce, quoted above, adds that Dutch shipping and shipbuilding industries look to the future with confidence. They seek no enlargement of their pre-war interests and do not want to encroach upon the right and position of their Allies. They only want to regain their pre-war place in the maritime industry which, they believe, they have always held deservedly. They feel that this desire will be understood and supported in the United States.

Figures on British Exports

For the first time, figures have been published giving some idea of the drastic cut in export trade which Britain has suffered during the war in order to conserve all her productive strength for the immediate war effort. The sixteenth report by the President to Congress on Lend-Lease Operations (published August 23, 1944) states that British exports, excluding munitions, have declined by more than 50 per cent in value and by 70 per cent in volume since the war began. The report adds that this is "in sharp contrast" to the position in the United States where cash exports exclusive of Lend-Lease were at an annual rate in excess of $2,800,000,000 in the first half of 1944, a figure higher than the annual average of 1935-38.

The table below shows the importance of exports in the British economy before the war. Exports paid for 58 per cent of Britain's huge imports in 1936-38, most of the remainder being met by payment for shipping services, interest on foreign investments and commissions. Since, during the war, Britain has also sacrificed a great part of her foreign investments to pay for war goods, has accumulated vast indebtedness, and faces a prospect of intense shipping competition, it is clear that only by a substantial increase in her export trade (Churchill says 50 per cent) will she be able to pay for post-war imports. Britain believes that her increase in exports, far from being at the expense of the export trade of other countries, will actually benefit other countries if it is part of a general expansion of international trade.

Britain's Balance of Payments 1936-38

In millions of dollars converted at pre-war rate of $4.87 to pound.

	1936	1937	1938
Imports to Britain	4,130	5,006	4,480
Exports from Britain	2,440	2,907	2,596
Adverse trading balance*	1,695	2,172	1,899
Met partially by:			
Income from shipping	414	633	487
Income from overseas investment	974	1,023	974
Commissions, etc	219	244	170
Total adverse balance	88	273	268

* Including allowance for silver bullion, specie, and government payments overseas.

The American President Lines



Henry F. Grady
President

> In our series of articles on the shipping lines of the Pacific Coast we are brought up short when we reach the American President Lines, for its future is obscure. We wish it were otherwise, for the vitality of Pacific Coast and World Shipping should not be given the jolt of a change in the smooth and able management of this outstanding asset of San Francisco and the West.—[Ed.]

Our old friend the American President Lines is in a rough sea, but the staunch service it has given during trying years should guide it through. The captain and crew know the sea lanes, their charts have been tested, the lights of service they have established on the headlands of 100 world ports should aid them now.

The invitation for proposals which the Maritime Commission has issued looking to the private ownership and operation of the line offers alternate plans. One plan provides for the acquisition of the control of the company through purchase of the Commission-owned stock. The other plan provides for the purchase of the vessels and the establishment of service on the designated routes. Under this latter plan, the successful bidder might not get the goodwill, corporate or operating name, or other assets of the company. Corporate dissolution of the American President Lines might be a condition required by the applicant.

The invitation itself seems to be fair, and it is simple and brief. President Grady has publicly praised the proposal, and the shipping world seems to agree.

San Francisco shipping has taken many a jolt and has enjoyed many a triumph. The possibility that the American President Lines organization might be broken up is a jolt, for there could be no long-time assurance that the present fine structure would remain intact if controls

S.S. President Harrison, the first gold star in American President Lines' Service Flag for floating equipment lost. While a prize of war on December 8, 1941, she was deliberately run ashore and wrecked by her crew.





E. Russell Lutz
Executive Vice President

changed. If the structure does remain it will be a triumph for San Francisco and for the world ports where American President Lines and its people are known.

There is a paragraph accompanying the invitation which justifies the hope of such a triumph. It is the paragraph that states, other things being equal, that the Commission will give preference to parties who have the support, financial **or otherwise,** of the domestic communities primarily interested in the service.

But in the field of public acceptance it seems unlikely that there are many companies in any field that can boast of such service by its officers to the public welfare as the American President Lines can.

When Henry F. Grady used to serve on numerous civic committees, San Francisco was using his well-known ability. When he was elected president of the Chamber of Commerce the business community was offering its highest honor and demanding during this critical period the best in business experience. When he was elected chairman of the Federal Reserve Bank the financial West



M. J. Buckley
Vice President — Freight Traffic

was taking the tops in integrity; and when he was picked by another shipping man to prepare the city for the United Nations Conference it was a recognition of his civic popularity.

Pacific WORLD TRADE

Thus the home town. The city knows him and offers its support and is not concerned with what the world thinks of him. But let's take a look at his world position.

Through the years Dr. Grady has served as expert for the old U. S. Shipping Board, has been Trade Commissioner to London and Europe,

Arthur B. Poole
Vice President and Treasurer



S. S. President Coolidge. With 4000 U. S. Army troops aboard, she became a war casualty off Espiritu Santo, New Hebrides. Expert seamanship saved all but one soldier and one crew member.



Pacific WORLD TRADE



William J. Bush
Vice President, Operations

Professor of International Trade and Dean of the College of Commerce, University of California, Chief (and promulgator) of the Division of Trade Agreements in the Department of State, Vice Chairman U. S. Tariff Commission, Assistant Secretary of State. He was the personal representative of President Roosevelt in making an economic survey of the Far East, head of the special War Commission to India, Vice President of the Allied Control Commission to Italy with rank of Minister, U. S. Chairman of the Rye Business Conference, director or trustee of such groups as the Federation of American Shipping, United Seamen's Service, U. S. Chamber of Commerce, National Foreign Trade Council, American Merchant Marine Conference and Propeller Club of the United States.

Don't ask the other A.P.L. officials to match the above list, but they are or have been active in many business or civic groups.

Executive Vice President E. Russell Lutz, after many years in legal and other advisory capacities in the Government, is active on various committees of the San Francisco Chamber of Commerce and of the Red Cross and Community Chest, is a member of the Executive Committee of the China-America Council of Commerce and Industry, and is now president of the Pacific American Steamship Association.



Thomas E. Cuffe
Vice President, Eastern U. S. Territory

Vice President and Treasurer Arthur B. Poole has been a director of the Chamber of Commerce, Presi-

American President Lines executives and directors on inspection tour of S. S. Sea Beaver — to be rechristened President Grant. Left to right are: Capt. W. G. Pearch, marine superintendent; Paul Hoover, director; O. G. Steen, vice president, Orient; A. B. Poole, vice president-treasurer; Henry F. Grady, president; E. Russell Lutz, executive vice president; M. J. Buckley, vice president, freight traffic; F. C. MacKrell, engineer in charge Washington office, Stone & Webster; W. J. Bush, vice president, operations; Charles R. Page, director; A. Emory Wishon, director. The APL has also purchased five other C-3's approaching completion at Western Pipe and Steel Co.'s South San Francisco yard. All are to be named after presidents.





Hugh Mackenzie
Vice President, Passenger Traffic

dent of the Foreign Trade Association, President of the Propeller Club and in frequent demand as a speaker at Commonwealth Club Section Meetings and other civic groups. He is a consulting professor in ocean transportation at Stanford University Graduate School of Business Administration.

M. J. Buckley, Vice President in charge of freight traffic, is dean of traffic men on the Pacific and holds a high place in the popularity of traffic and other business organizations throughout the country. A convention is not complete until Mike Buckley has brought it up to date on developments in his field of activity. He is past president and director of the Family Club and is now president of the General Agents and Agents Association of Pacific Coast Operators.

Hugh Mackenzie, Vice President in charge of passenger traffic, is past president of the Transportation Club of San Francisco.

Oscar G. Steen, Vice President for the Orient, illustrates, as well as anyone could, the spirit of the entire organization from top to bottom. With war appearing imminent, he moved the company's headquarters in September, 1941, from Shanghai to Manila and stayed there until he and his staff were seized by the Japanese and interned in Santo Tomas. He was repatriated two years later and has been directing the company's affairs in the Orient from San Francisco.

An important figure in his field of operations, Mr. Steen was director of the American Chamber of Commerce in Shanghai, member of various boards on business and relief matters and of the Shanghai Municipal Council, as well as Trustee of the Foreign Y.M.C.A.

If public relations are important, Gene Hoffman surely has a place in the picture. As a former market editor, news bureau manager, and president of the Peninsula Commuters Association, he knows the public pulse. Although he spent three years with Matson and seven years with A.P.L., Gene is best known in maritime circles as secretary-treasurer of the Propeller Club, Port of San Francisco.



Oscar G. Steen
Vice President for Orient

Standing by to the last throughout the Far East to give the nation the benefit of their vast knowledge of Far East transportation problems, 31 members of the American staff of the company were interned by the enemy. Only 14 have been repatriated. The remaining 17 are still prisoners of war.

Many of the company's ships have notable records, and two of them should have special mention.

The President Harrison, having delivered her complement of U. S. marines at Manila, was en route back to North China to evacuate additional marines from Peking. Overhauled by Japanese naval units off Woosung, the captain and crew risked their lives in deliberately wrecking the vessel on a rocky island in the East China Sea.

The President Coolidge, with 4000 U. S. Army troops aboard, became a war casualty in the South Pacific. Expert seamanship resulted in the saving of all hands aboard, with the exception of one soldier and one crew member reported missing.

The American President Lines organization knows Far East and round the world transportation. It is acquainted with the location and sources of traffic, both passenger and freight. It knows the peoples, the public officials, foreign trade conditions and commercial practices. It is familiar with Far East money exchange, immigration laws, customs, quarantine and all the problems inherent in Far East transportation operations, and after relinquishing its wartime agency for many lines, and for from 120 to 150 vessels, and restoring its war service employees, the wealth of experience of this fine organization makes it a mighty force for the resumption of trade and travel in the East.

The shipping world hopes that it has an uninterrupted future, and that the great experience and ability of the APL personnel will not be lost to San Francisco and Pacific shipping.

Eugene Hoffman
Manager of Public Relations



Foreign Trade
and the National Economy

By Amos E. Taylor
Director U. S. Bureau
Foreign and Domestic Commerce

In attempting to outline some of the things that should be done in order to achieve the objectives of high levels of production and trade it is perhaps easier to say what should not be done than to state in simple terms the exact things that should be done. I know an overall answer is often not possible unless we oversimplify the problem itself. Yet this often proves dangerous because it tends to place all the emphasis on one facet of the broader problem. It is such a simple but unsound method which often leads to simple questions designed to suggest an equally simple answer. Should we give our goods away? or, should we send our money abroad? The first carries the tacit assumption —even though the questioner would probably not admit it—that we necessarily live in a world of conflict and economic chaos and that we can isolate ourselves by "minding our own business."

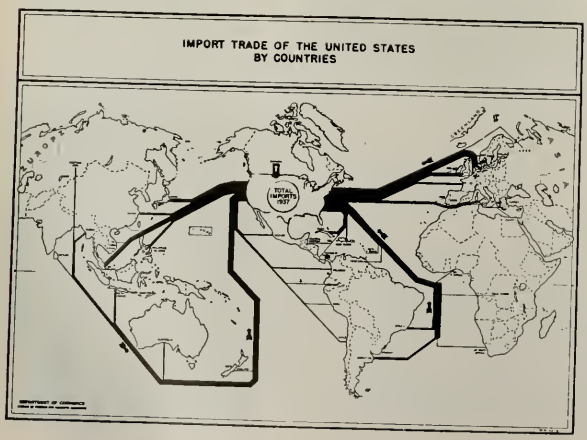
The important thing is that whatever we do should provide a benefit, and that, whatever the contribution, it serve the purpose of creating a condition under which we can actually



Amos E. Taylor

accept things that are offered in exchange, be they goods or services or some other benefit. As to the question of "sending our money abroad," the phrase carries implications without expressing any real meaning. The inference is that investment outside the country is unnecessary, unproductive and economically unsound. The truth is that trade and investment go together. Obviously investment made abroad purely for the sak of achieving special temporary gain or for satisfying a momentary specu lative urge serves no useful purpose More important, it contributes noth ing to the maintenance of that ver stability which is so essential to healthy world economy. This hold true in any investment market do estic or foeign.

I refer to these two particular type of question largely for the purpos of bringing our problem into focus They project themselves almost in variably when the problem of post war international economic relation ships is viewed from an emotional angle. I think it is fair to say that one of the greatest dangers confront ing us at the present time is that some of us may again fall into the error, as we did after the last war, of seeking solutions to strictly economic problems through an emotional approach. Let us therefore look at the problem of international investment from the standpoint of practical meaning. Until the first world war, the United States was a net debtor nation. During the nineteenth century our growth and expansion resulted to a substantial degree from our borrowing in foreign markets. By the third quarter of the century, or even before, the necessity of making interest and dividend payments to our creditors provided us with a good market abroad for agricultural and other products. These investments were, of course, of a sound character, and both trade and foreign borrowing during our developmental years moved together on a high level. Both we and our creditors benefited in the process.



The world has abundant resources that call for development. Such development in many cases is possible only through the use of foreign capital. These resources are thus the basis of mutual benefits to debtor and creditor alike. They are potential factors in the achievement and maintenance of high employment and production throughout the world. Again, trade and investment go together.

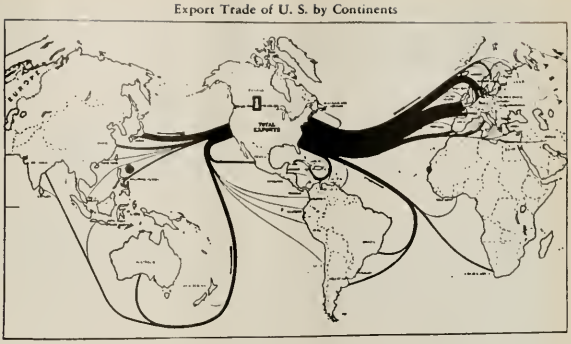
Let me turn once more to the pub-

lication, "The United States in the World Economy." I want to call your special attention to a section in which the volume of imports into the United States is examined alongside the index of industrial production. The relationship is very close, for reasons which are fairly clear. A substantial part of our imports consists of raw materials and semi-finished products which are essential to American industry. Moreover certain other important imported commodities are in increasing demand when the level of national income rises. Since these imports become the source of foreign buying power for American products it is apparent that a high level of prosperity in this country is bound to be a tremendous stimulant to world trade as a whole. This flow of exports and imports exerts a tremendous influence upon the stream of international trade generally. Many countries are dependent for a substantial part of their national income upon shipping, and unless goods flow in large volume their ships are idle. Many other countries rely upon the export of one or two basic raw materials as the principal source of foreign buying power. Any shrinkage in the general volume of trade which continuously presses down hard on their share will tend to bring about exchange controls and other restrictions which, as we saw during the 1930's, soon have repercussions in other markets and thus precipitate restrictive measures on an ever-growing scale. Unless, therefore, trade can be kept relatively free it tends to fall to lower and lower levels and in the process creates international friction in those quarters which are most seriously affected.

According to the 1939 Census of Manufactures, the Pittsburgh area had 1.1 per cent of the total number of industrial establishments in the United States. The persons employed in these establisments represented 2.4 per cent of those similarly employed in the country as a whole. On the basis of total salaries and wages paid, the corresponding percentage was 2.8. This degree of participation by the Pittsburgh area in the manufacturing operations of the country as a whole does not reflect the real significance of that community any more than does the figure of 9 per cent reflect the real significance of this country's export trade to our domestic economy.

Industrial operations throughout

Export Trade of U. S. by Continents



the country are very closely interrelated. For example, much of the steel and glass manufactured in that area passes into other industrial areas. What appears at first to be a local interest immediately extends itself throughout a series of both domestic markets and foreign markets. Our automobiles, to cite a simple example, are well known all over the world. These motor cars are in part your product. This example could be multiplied many times, particularly in the case of an industrial area such as that centering around Pittsburgh in which the diversification of output includes various types of steel products, electrical machinery, glass, machine shop products, safety equipment, food products, and many others. In no event can any area which contributes 2.6 per cent of the value of all industrial manufactures in the United States be called an unimportant factor in either the national or the international economy. Each such part is vital to the whole. Certainly we cannot afford to fall back to a prewar level of output and national income.

Small Business

I want to call special attention to the interest of small business in our post-war economy. Many of the larger manufacturers have established branch plants in order to serve their foreign markets. The original purposes for establishing these plants have varied somewhat, but they have been a natural development in the organization for serving markets on a broad basis. Yet their size and scope of operations do not set these concerns apart from the rest of our business structure. Smaller concerns have a real interest, both direct and indirect, in the same markets. The small businessman, whether manufacturer or distributor, is an essential part of the business community and should be so recognized by his Government. I have already called attention to the fact that such a product as the motor car is in effect a composite of the output of a very large number of concerns scattered over wide areas. In many such cases the small concern plays an essential part in the maintenance of a well-balanced industrial structure and in the servicing of world-wide markets. It doesn't follow, of course, that every small business should view the export market as an easy means to broaden its total market. It takes more than good intentions and a trade list to succeed in the "profession" of exporting. But this warning applies in fact to any business, large or small, which assumes that a ready market awaits every article available for sale.

Genuine markets, whether domestic or foreign, reflect the application of effort and energy in producing goods that are in demand. Production, buying power and markets are

(Continued on page 473)

Venezuela—

Land of Oil

Drawings from Coordinator of Inter-American Affairs

Venezuela is a country with which the United States has maintained close relationships, but whose products have gone elsewhere. There was a simple reason for this condition, and it is probable that from now on we will import most of what Venezuela has to offer.

Many people think of Venezuela as a country with no external debt. That is a condition that has existed through most of the country's history and is based on the fact of its tremendous output of petroleum.

Venezuela is about the size of Texas and Louisiana combined, as indicated in the drawing, and its southern tip is just north of the equator. Like most of the northern and western countries of South America, the mountains dominate everything—the crops, the habits of the people and even relationships with the people of adjoining countries.

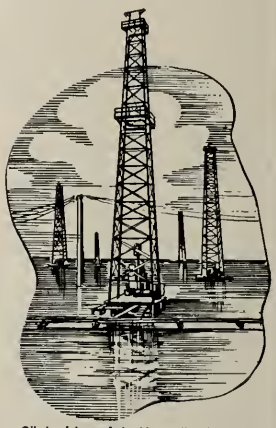
Historically Venezuela, like several of its neighbors with whom it was once joined, owes its independence and much of its tradition to Simon Bolivar, and its stormy history is a reflection of that of the Liberator.

Because oil and coffee are the country's major products and principal exports, and because the United States produced its own oil and imported its coffee from Brazil, the trade of Venezuela flowed to Europe. It is likely that we will be importing oil from every convenient source in the future, and it is also likely that the Venezuelan coffee, which is of a different quality from that of Brazil, will find increasing favor here, especially for blending purposes. Thus Venezuela, whose economy is almost entirely dependent on imports and exports, will be drawn closer to the United States.

VENEZUELA, showing products.

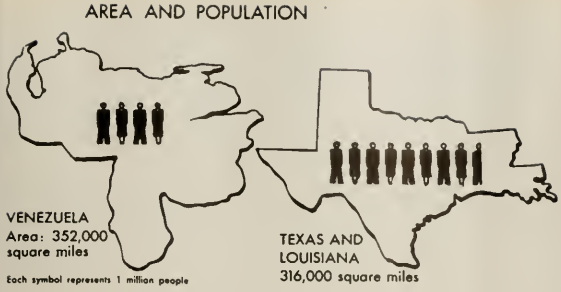


Venezuela has a population of a little over 4,000,000, with a literacy rate of about 30 per cent. One reason for this low rate is that the population is quite scattered and transportation very limited. The railroad mileage of the country is but 625 against a mileage in Cuba, for instance, of 3310. As the wealth of the country accumulates many things which Venezuela consciously lacks will be imported in large quantities, with special emphasis on railroad and highway equipment and automobiles. In 1938 the government initiated a $100,000,000 program of public works, which includes the construction of highways, railroads, schools, sewage and water systems, hospitals and low-cost housing. The war interrupted this program, but it will be carried through as soon as materials can be imported. Most of them will come from here, and as is so often the case with improvements that raise living standards, the public works themselves are only the beginning. Highways will mean the importation of automobiles and trucks.



Oil derricks on Lake Maracaibo. Most of Venezuela's oil comes from below this lake or along the sea coast.

Pacific World Trade

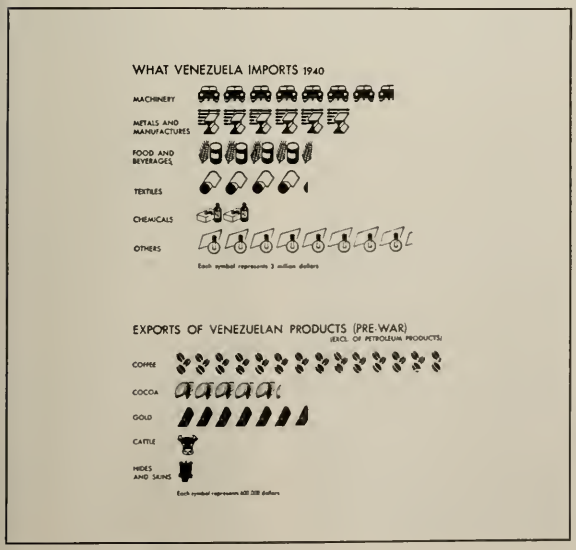


Railroads will require a continuing importation of cars and locomotives, water systems bring bathtubs. And increasing exports and imports will mean more ships, more port facilities and a greater interchange of tourists.

Oil from the Lake

Lake Maracaibo is the largest lake in South America. In an average year 187,000,000 barrels of oil have been pumped from beneath this lake and from lesser known fields around the mouth of the great Orinoco river system. In fact most of the oil of the country comes from beneath, or near, the water.

Venezuela was explored by Columbus and Vespucci, who still thought they had reached the East Indies. In this year 1945 the wealth of the Indies and of Venezuela is not in spices but in oil.



Foreign Trade and the National Economy

(Continued from page 471)

interdependent; each one helps to create the others.

From what has been said it is evident that trade policy involves many elements. Exchange control, trade restrictions, monopolies, subsidies, quotas, cartels, commodity agreements—all constitute a panorama of international economic scenery to each of which we tend to direct a degree of special attention depending upon our interests or prejudices. The Bretton Woods agreements have taken cognizance of some of these elements. With regard to cartels, we have had the benefit of much discussion in both official and private quarters. All of these items have for some time been subjects of considerable thought and discussion. In combination they present us with a complicated and difficult problem. This very fact makes it necessary that we don't attempt to seek a solution through oversimplification merely in order to terminate our thinking about the issues. There is always present the danger that because the larger problems are difficult and because there are differences of opinion among the United Nations we try to oversimplify them by reducing their scope of applicability. The important thing is not whether the average British view agrees with the average American view, but whether in each country we retain a system which permits free debate and discussion and therefore a means of agreement and understanding.

Business in this country looks hopefully on the possibilities of foreign trade after the war. Our productive capacity has reached the highest point in our history and our primary goal is full employment. The war has seriously impaired the buying power of many countries which have in the past been among our best customers. Some of the European countries and most of the Latin American countries have substantial dollar balances available. Important as these may be in stimulating sales of our products immediately after the war, their utilization is no substitute for the most fundamental measures

necessary to assure stable currencies and the international movement of goods in large volume.

British Trade

I stated in the beginning that economic health is essential at each end of an international commercial transaction if trade is to continue on a favorable level. Since Great Britain is normally this country's principal customer it follows that Britain's ability to secure dollar purchasing power will determine in important measure our success in reaching estimated goals in post-war foreign trade. The liquidation by the British authorities of the major part of British-owned American securities prior to the passage of the Lend-Lease Act has removed an important source of purchasing power which will have to be replaced from other sources if this important foreign market is not to shrink. Britain's own great need for export markets after the war together with the importance of foreign markets to this country point again to the necessity of a greatly expanded volume of international trade and the freest possible movement of goods and services. The nature of this problem suggests how we must deal with current international economic issues if high employment, maximum production and high standards of living are to prevail in this country and in the rest of the world.

California-Built Dredges

(Continued from page 463)

ing. Dredges can be towed in this manner if properly designed and prepared against seagoing risks. Dredges from Holland have been towed to Netherlands East Indies. Yuba dredge hulls towed from Tampa, Florida, to Barranquilla carried partly erected superstructures and deck loads. The latter were partly removed at the Colombian port to provide lighter draft. They were towed upstream for several hundred miles, and to aid in getting over sand bars temporary power was furnished on the decks for the winches. Lines carried forward from a winch to shore helped pull the tow over shallow bars.

In Korea, material for Yuba dredges, built more than 15 years ago, was hauled many miles by ox-cart, and many flat heavy pieces of steel were skidded along the ground by ox teams. Coolie labor actually moved a short section of railroad, piece by piece, and moved a car carrying heavy dredge units, which could not be further reduced in weight. The rails and ties behind the car were carried around it, re-laid on the ground. Then the car was pushed a few feet and the operation repeated. After being unloaded the car was pushed back over the same 20 miles to the railroad again by the same process. Future dredging fields of this type will be reached by air, no doubt; the relatively high cost will be cheaper than the cost of labor and lost time caused by the use of even the cheapest labor. Modern trucks will be available, also, and be counted in the cost of initial equipment needed to build a dredge.

Pacific WORLD TRADE

Dredges for export, like all material sold abroad, must be properly documented and cleared by United States authorities and agencies of countries buying the dredges. Many strange demands are made; at least they may seem to be strange to an inexperienced shipper. If the customer wants 25 copies of a packing list, Yuba furnishes it without questioning. Paper is cheap even if the packing list is a hundred or more sheets in length. Field drawings for erection must be clearly drawn and furnish all the information needed by erectors who may or may not be acquainted with the English language. Yuba furnished erection drawings for five platinum dredges built in USSR by photographing original tracings and printing all dimensions and instructions on the copies in Russian. Marks on shipments and all documents were likewise made to suit the customer's needs. These are important factors when doing business abroad, and often a small amount of extra work makes firm friends and avoids endless confusion and later claims.

It is always desirable to have reliable agencies abroad, but not always is it possible to secure the services of an agent with an engineering training or background. Most sales agencies are profit-minded but know little of actual operating needs. Yuba maintains its engineering department in San Francisco and encourages purchasers of dredges for use abroad to visit and discuss operating problems there; thousands of dredging devices are on record and have been tried under varying conditions. Selling specialized machinery, in units which represent an investment of a million dollars or more in most instances, forces the manufacturer to consider his customer's needs with more than ordinary care. It is easy to lose sight of the fact that a sale abroad, if it results in an operating failure, is the poorest kind of advertising for American products. To insure, within reason, the success of every dredging venture employing a Yuba dredge or equipment requires sound engineering and the confidence of the buyer. This confidence can be helped, as it has been done by Yuba over the years, by careful preparation of shipments which arrive at destinations without damage or avoidable loss en route and accompanied by documents and field drawings which can be used.

C. M. Romanowitz, Yuba's sales manager and chairman of the Bay Area Foreign Trade Committee, said:

"San Francisco always has been export-minded and the future should bring plenty of inquiries for California products. We have many old friends and customers from whom we are separated by the war. The day is not far distant when we shall hear from them again; also from newcomers to the dredging industry who may want to learn of recent developments. It is always a pleasure for us to pass along any useful information. This is a tradition among dredgemen of the state, and is one reason for the quick rise of dredging, many years ago, to a leading position in California as a producer of new wealth. Firms seeking business abroad can do much to further the same friendly spirit which exists among individuals in American industries, even though they are competitors."

To succeed abroad, as Mr. Romanowitz points out, American firms must first learn their customer's actual needs and then satisfy them in a manner no different from doing business at home.



Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

The Gyro-Compass

Part IX.—MAINTENANCE

When it comes to the question of maintenance, the attitude of the gyro-officer is a very important factor in obtaining the best results. Most of us who have worked on gyro-compasses have a real feeling of pride about them. There is something very reassuring about the gyro humming away, as it does, day after day and never ceasing to pick up that tiny crumb of directive energy from the majestic onward movement of the earth. The care of the gyro should never be regarded in the light of a chore to bother the operator and consume his time. The gyro is more than human in its ability to guide the ship accurately through any weather, in any sea, and will repay many times in faithful service for the small amount of time the gyro-officer need devote to it.

The way to obtain the best results from the gyro-compass is to follow the oiling and cleaning instructions to the letter, and to refrain from experimenting. Don't consider the compass as a delicate instrument which has to be babied. **Let it alone** except when oiling, cleaning or inspecting; follow instructions contained in the oiling and cleaning chart on the bulkhead in the gyro room. If the time comes when you are confronted with an unexpected situation, remember that common sense is a good remedy for most ills. If the situation is carefully thought out, the answer to it, and the cause of the trouble, will usually be found to be quite simple. Every gyro-compass equipment is, as stated above, supplied with a large framed oiling and cleaning chart, which is hung in the gyro room. When to oil, how much to oil, and when and where to clean is explained on these charts, and the operator will have no difficulty in locating the proper places on the compass, as these charts are fully illustrated. The compass rotor oil which is used for the main rotor bearing oil wells and for most of the other bearings of the gyro-compass can be obtained from the manufacturer **and no other oil should be used.** I make this statement not because the compass manufacturer likes to sell oil but because much money and a great deal of time have been spent in experimenting to determine just the grade of oil which will make for the best compass operation.

Many adjustments outlined in the following maintenance instructions will never have to be made. As a matter of fact, sometimes I think it would be better for all hands if I did not mention them, as doing so always leads to the possibility that some operator will make a wrong diagnosis as to the compass trouble, and will proceed to adjust this, that and the other thing, to the detriment rather than to the improvement of the compass. However, if the operator will make it a point to refrain from adjusting, resetting or replacing unless he is **absolutely sure that he is right,** I believe that the instructions which follow will be of some benefit, as there will undoubtedly be some instances where any one of them may be the answer to his trouble.

The Master Compass Routine Inspection

Each Watch

Check repeaters with Master Compass to be sure repeater system is functioning properly. If current supply fails for any reason be sure to check and, if necessary, synchronize repeaters as soon as current supply is restored.

Take an azimuth to determine gyro error, if any, if possible each watch.

Check auxiliary latitude and speed-latitude correctors each watch and reset whenever changes in latitude or speed make resetting necessary.

Check oil level in rotor case.

Check voltmeter on starting panel to see that it reads 70 volts, and check ammeter on amplifying panel to see that it reads .4 ampere.

Check course recorder to see that it is functioning properly, and that pens are making a continuous track.

Inspect compass to guard against any abnormal condition of operation.

Each Week

Check alarm unit by turning on switch to determine if buzzer sounds.

Check all electrical connections to make sure they are all tight, clean and free from oil.

Clean and oil parts as indicated on oiling and cleaning chart in gyro room.

Each Month

Check alignment of azimuth motor brushes.

Clean and oil parts as indicated on oiling and cleaning chart.

Care of Mercury Ballistic

The mercury ballistic reservoirs are ventilated through small holes in

the reservoir tops so that the mercury will not become air-bound as it flows from one reservoir to the other. The air which enters the reservoirs is strained through soft felt wicks to keep the mercury as clean as possible. However, due to the presence of this air and the fact that the mercury is constantly agitated by the hunt of the compass, a certain amount of oxidation of the mercury takes place. This takes the form of a film on the surface of the mercury and eventually the film will retard its free movement. For this reason the mercury should be checked about every three months to make sure that it flows freely. For economy of upkeep and maintenance, the following instructions should be followed in inspecting and, if necessary, in changing the mercury. The operator should keep in mind that the mercury ballistic is the controlling element of the compass and that a great deal of care must be exercised in handling and adjusting it. **Adhere to the letter in following these instructions.**

To observe the flow of mercury in the ballistic, remove tops of reservoirs, unlock case and tilt ballistic from side to side. **This must be done only when gyro is not running.** The mercury should flow freely from one reservoir to the other. The appearance of film on the fluid is not harmful, **provided the mercury flows freely.** If the mercury does not flow freely, proceed as described below. If it does flow freely, replace reservoir tops but **be careful not to interchange them when replacing, as they constitute a part of the balancing system of the compass.** Any interchange of the reservoir tops will make for an unbalanced compass, and will introduce a variable error in the gyro.

To Change Mercury

If the mercury needs changing, remove the ballistic from the compass in the following manner: Remove two screws which attach link arm to ballistic frame. Lower the link arm carefully so that it slides easily away from the link bearing (eccentric stud) on bottom of rotor case. Back off the mercury ballistic bearing studs until they are clear of their bearings. Lower ballistic frame until it is clear of the compass and remove from binnacle.

Pour out the old mercury, keeping the mercury removed from each set of reservoirs in separate non-metallic containers. Wipe out the reservoirs carefully with a clean cloth moistened with carbon tetrachloride. **(Do not use gasoline or benzine.)** Make sure that all carbon tetrachloride is evaporated from the parts, and that the parts are thoroughly dried, before replacing the mercury. Clean out mercury tubes with pipe cleaners. After using these cleaners, blow out each tube to remove any lint.

Carefully strain the mercury which has been removed from the west reservoirs through fine cheesecloth until it is bright and clean. Then pour this mercury back onto one of the west reservoirs, pouring the mercury in a continuous stream so that no air bubbles are trapped in the tube. Repeat this process for mercury removed from east reservoirs. **If any mercury is spilled during this process, both sets of reservoirs should be emptied and refilled with fresh mercury found in glass bottles in the spare parts box.** Each bottle contains eight ounces of mercury. **Pour the entire contents of each bottle into each set of reservoirs as described above.** After refilling ballistic with mercury, replace reservoir tops, **making sure not to interchange them.** The wicks in the mercury pot covers are to provide ventilation only, **and should never be oiled.** To replace ballistic on compass, proceed as follows:

The west bearing stud is pinned to its lock nut and should be screwed in as far as it will go. The east stud should be adjusted so that the ballistic has about 0.005" side shake when compass is cool. The lock nut should then be taken up so that stud is locked in place. If possible, use feeler gage to determine the proper side shake (clearance). If gages are not available, the stud may be replaced properly by making a mark on the phantom ring in line with slot in stud before removing ballistic. When replacing ballistic, take up stud until it is tight, then back off until it is in line with the mark. **If this method is used care must be taken so as not to back off one-half of a turn too much.** When replacing ballistic, make sure that north side of ballistic frame (a letter N is stenciled on north side of the frame) is on north side of gyro case. When replacing link arm make sure it engages link bearing properly before attaching arm to ballistic frame. Replace the two screws which attach the link arm to ballistic frame. Be sure that all screws and nuts are drawn up snugly.

Various Adjustments and Replacements to Adjust Lost Motion in Transmitter

Turn the adjusting knob on the top of the transmitter to remove lost motion.

To Replace Transmitter On Lubber Ring

The best advice in connection with this adjustment is **don't remove the transmitter from lubber ring.** However, if removed, replace as follows:

Position the compass card so that it reads to an exact degree. (Card may be turned the slight amount required by turning azimuth motor shaft.)

Turn lost-motion adjusting knob on top of transmitter all the way counterclockwise to take up, as much as possible, lost motion in transmitter carriage drive.

Place roller carriage on contact segment Number 1.

Put transmitter in place and make sure its gear meshes properly with azimuth gear. Insert mounting screws loosely. With card on an even degree, shift transmitter until roller is again positioned on segment (if it was moved while attaching transmitter). Take up tightly on mounting screws.

Start compass and repeaters. Check repeater readings and synchronize with Master Compass. If, when compass card is on an exact degree heading, repeaters do not exactly synchronize, loosen mounting screws of transmitter and tap it so that it moves slightly along its elongated mounting holes until repeater readings match exactly with compass reading.

To Adjust Azimuth Motor Gear Mesh

Loosen azimuth motor mounting screws.

Position azimuth motor bracket adjusting screw (found under azimuth motor gear guard) so that there is about 1/10° backlash in phantom element. This can be determined by grasping phantom ring and estimating amount of "shake" possible without moving azimuth motor shaft.

This adjustment must be made

properly to obtain a satisfactory hunt in the compass and also to prevent overloading the azimuth motor. Once this adjustment is made, it is not necessary to remake it unless the azimuth motor position has been disturbed. **This adjustment must not be used to alter the hunt.**

To Adjust Azimuth Motor Brushes

The azimuth motor brushes are clamped in holders mounted on the azimuth motor frame. The brushes should be adjusted so that, when they are seated on the commutator, the brush holders are parallel to each other. To obtain this condition, loosen brush clamping screws, adjust brush and reclamp. When holders are parallel, the distance from the commutator to holder is approximately one-quarter inch. When brushes are readjusted, sand them in to fit commutator.

To Adjust Lubber Line Plate (Correction Plate)

This correction plate is provided on the compass to compensate the reading for **small permanent errors. Do not move this plate until you are absolutely sure that you have a permanent error in the compass. Do not, under any circumstances, attempt to remove any permanent error by twisting the suspension.**

The correction plate is moved as follows: Suppose the compass reading is 278° and it has been definitely determined (by azimuths, bearings, comparison with magnetic compass, etc.) that the compass has a 2° easterly error. Simply loosen the thumb nuts which clamp correction plate to the lubber ring and shift the plate so that the reading is 280°. Reclamp plate. **It will then be necessary to synchronize repeaters and course recorder so that they will repeat the corrected reading of the Master Compass.**

To Adjust Roll and Pitch Dampers

The roll and pitch dampers are used to reduce the movement of the compass in its gimbals. The pitch damper is of the friction type, having an adjustable friction brush riding on a cam. To adjust brush to get proper damping action, proceed as follows:

Loosen clamping nuts and raise brush off cam far enough to insert a small piece of paper under brush. Position adjusting nuts, keeping friction brush holder horizontal, so that when clamp nuts are taken up tight it is just possible to withdraw the paper without tearing it.

In heavy weather it may be necessary to take up on the dampers to prevent the compass case from hitting the stop on the vertical ring. However, as soon as the ship gets out of heavy weather the dampers should be readjusted as described above. If this is not done, a compass error may result.

(Maintenance continued in next issue.)

Unsinkable, Self-Bailing Lifeboat Invented in Sweden

A lifeboat of novel and interesting design, which has proved itself unsinkable after having been capsized by force, has been designed by E. Sivard, a Swedish inventer.

The boat is built entirely of galvanized steel plate. Its capacity is 25 passengers, of whom 18 can sit in the cockpit without crowding, while the rest find place in the two domed cabins fore and aft. Below decks are holds for oil, water and other supplies. The craft is powered with a 10-hp Bolinder engine, and in addition to the 35 gallons in the oil tanks, an adequate number of oil cans can be carried, assuring a cruising range of 600 nautical miles in smooth sea. Under power the boat can make about six knots in calm water. The two masts carry sails with a combined area of about 200 square feet. Under sail she makes good steering speed in a light wind and tacks easily.

The capsizing tests included one in which a crane was used to tip the boat over with the keel straight up. She immediately righted herself and quickly baled herself empty through the large ports. The hull, it was discovered, was relatively light to tilt on an even keel, but quickly attained considerable rigidity upon heeling over.

The principal dimensions are: length 23 feet; beam 8.5 feet; draft 3.7 feet. The weight of the hull, with engine, is 2½ tons, and with full equipment and a load of 25 passengers on board 5½ tons.

Self-bailing, non-sinkable lifeboat.





Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Surfacing Commutators

These comments regarding commutators apply equally well to motors or generators. Maintenance has an important bearing on the life of commutators and brushes. Inspection at frequent intervals is desirable so that surface faults may be detected and corrected with a minimum of loss of time. If corrected promptly a long shut-down may be avoided.

Sandpapering is generally a satisfactory method of removing foreign deposit from a commutator surface, correcting roughness or reducing high mica, providing the contour of the surface is a true circle and running on its true center. Sandpaper cannot be used to remove flat spots or high bars. It may appear to eliminate them, but the effect is only to broaden the spot so that it no longer is apparent to the eye. Such a condition will have to be corrected by grinding or turning, or perhaps stoning, with a rigid mount for the stone.

Use a rather fine grain sandpaper and take a reasonably long time to do the job in cleaning a commutator surface. Deep scratches are thus avoided. Some engineers consider sandpapering the best way to polish the surface after turning. It is good practice to attach or hold the sandpaper to the face of a wooden block, which has been smoothly cut to fit the contour of the commutator. Lateral or axial motion of the sandpaper should be quite slow to avoid diagonal marking. The machine can be run at speed, brushes lifted, and with motors which will run with power brushes down, the sandpaper block should have a handle on it so that the hand need not contact the brush assembly while energized.

One objection to the use of sandpaper is that it seldom leaves the bars properly round to the circle of the whole surface. Most commutators will be found with undercut mica, but for flush mica jobs the tendency is for the bar to be flattened between the mica segments. A little oil on the sandpaper will cause the mica to cut faster and the copper to cut slower, and improve the operation. Too much oil must not be used, as it will soak into the mica.

Undercut or slotted mica commutators have a tendency to cut with the center of the bar high and the sides of the bar low, even though a truly shaped wooden block is used with the sandpaper. Oil should not be used on undercut jobs, as it will cause copper dust to embed in the slots.

Emery paper or cloth should never be used on commutators, especially when used with the brushes down and energized. Emery is an electrical conductor and particles will catch in the slots, causing sparks.

The tendency of sandpaper to broaden rather than remove flat spots (deviation from a true circle) and to distort the true circular contour of the surface of the bars results from its flexibility. The use of a commutator stone is therefore preferred to sandpaper.

The hand commutator stone presents a rigid contact surface to the commutator. It should be formed or worn to the curvature of the commutators and have a span of contact substantially greater than that of the broadest flat spot to be removed. But even with this tool hand supported, while flat spots may be removed, there is no surety that the true circular contour of the commutator will be obtained. It is liable to be finished slightly oval or egg shaped.

The results are much improved if a rigid rest can be found for the stone, even though it is still guided by hand. If any degree of vibration of the machine is present even this method will not assure circular shape.

Hand turning with a stone requires considerable skill, as it is easy to cut deep or to shudder the stone, and unless the operator has had some experience it would be better to resort to grinding or turning with a steel tool.

When using the stone as a hand turning tool (using a small area in contact and guiding the stone by hand, but supporting it against a steady rest) the best results will be had by running at below normal speed. The speed at which the stone cuts most freely will be found by experiment. But when smoothing with a broad surface in contact with the commutator, it is better to run at full speed. The cutting action of the stone is best when it wears away its own cutting edges faster than it cuts copper, thus continually presenting new cutting edges to the copper.

Never use oil on a commutator stone as it interferes with the cutting edges and may cause the stone to clog with copper. Several grades of cutting stone are available on the market, from fine polishing to very coarse cutting types. Always finish the job with a polishing action.

It is always desirable to take some action to prevent the sand, stone and copper particles from being drawn into the armature winding by the natural ventilation windage of the machine if an extensive operation is planned. It is quite easy to cut heavy paper in a circular shape so that it may be placed over the end turns and risers of the armature, holding it in place with Scotch tape or adhesive tape, or some kind such as painter's masking tape, or strong cord. This

may not be necessary for short jobs.

Burnishing the commutator is an important operation following any resurfacing operations. In any method of finishing the surface, diagonal scratches or deep scratching must be avoided, as the non-abrasive brushes used with modern machines will not polish out these scratches for weeks, perhaps months, of operation. Scratches fill up with fine particles of carbon, giving the surface a dull and dirty appearance, and possibly causing unnecessary brush wear.

Examination of a newly stoned or sanded commutator under a microscope will disclose a sharp elevated edge on many of the surface grooves and scratches. These can be removed and a good polish obtained by burnishing with hard wood blocks, such as hard maple. The end grain is applied to the copper surface.

There are many methods of application of wood for burnishing. The block may be pressed against the commutator by hand, in the same manner as a stone is used, or blocks, shaped like the brushes and installed in the brush holders may be used. Enough should be fitted to cover the entire surface axially. Much pressure may be needed unless some length of time for burnishing can be allowed. A steel band lined with blocks and applied like a prony brake has been used for burnishing in the factory.

With adequate pressure on the wooden blocks much heat is generated, and care should be taken not to raise the temperature of the commutator above a reasonable value, as this would cause unusual expansion. It is normal for the wooden blocks to turn black and burn slightly.

The back of sandpaper, either a thick pad of it or one or two sheets supported by a contour block, will exercise considerable burnishing action on a high speed commutator.

In addition to removing edges of scratches, burnishing also helps by the oxide film deposited due to the raise in surface temperature of the commutator. This has a favorable influence on the brush performance.

In connection with scratches and grooves in the copper surface of the commutator bars, it must not be concluded that the spiral thread-like groove cut into the surface with a lathe tool is undesirable. Where this groove is reasonably deep and wide, say 1/16 inch or thereabouts, and otherwise the surface is burnished, there may be considerable merit to the groove. Many operators and engineers advocate this groove or spiral thread on the basis that it tends to relieve the air pressure under the brush face and prevents localization of current with the resultant copper picking and selective action. (Copper imbedded in the face of the brush, and corresponding ring grooves cut in the copper bars around the commutator.)

Our next article will discuss the grinding and turning of commutators.

BOOK REVIEW

1944 Book of A.S.T.M. Standards, in three parts. Published by American Society for Testing Materials, 260 South Broad Street, Philadelphia 2, Pennsylvania.

This book contains, in their latest approved form, all of the Society's widely used specifications and tests for materials. A most important book in connection with the production, purchase and use of materials, the latest edition has 1235 specifications and standard methods which cover more than 6000 pages.

All specifications, whether formal standards or tentative, are given. The three divisions of the book are as follows:

Part I, Metals. Ferrous and nonferrous metals (all A and B and some E serial designations) except methods of chemical analysis. General testing methods (E serial designations).

Part II, Non-metallic Materials—Constructional. Cementitious materials, concrete and aggregates, masonry building units, ceramics, pipe and tile, thermal insulating materials (all C serial designations). Wood and wood preservatives, paints, varnishes and lacquers, road materials, waterproofing and roofing materials, soils (certain D serial designations). General testing methods, thermometers (E serial designations).

Part III, Non-metallic Materials—General. Fuels, petroleum products, electrical insulating materials, rubber, textiles, soaps and detergents, paper, plastics, water (remainder of D serial designations). General testing methods, thermometers (E serial designations).

An innovation is the inclusion of all emergency standards and emergency alternate provisions which have been widely used to expedite production and procurement of important materials.

(The Society has issued a separate volume on Chemical Analysis of Metals, including standards and recommendations for both ferrous and non-ferrous metals. These methods are not included in the Book of Standards.)

Each part of the 1944 book has a complete subject index (from 36 to 44 pages). There are two extensive tables of contents; the first lists all standards under general materials headings; the second according to the serial designations of the standards.

To keep the books up to date, a supplement will be issued to each part late in 1945. As a service, there is a complete 200-page Index to Standards, which is furnished without additional charge and a copy accompanies the purchase of each part or complete set.

The cost of each part is $10; the charge for supplements is $4 for each part, each year. For half-leather binding add $1 extra for each part and each supplement part.



Monroe Paulsen, owner of Hercules Equipment & Rubber Co.

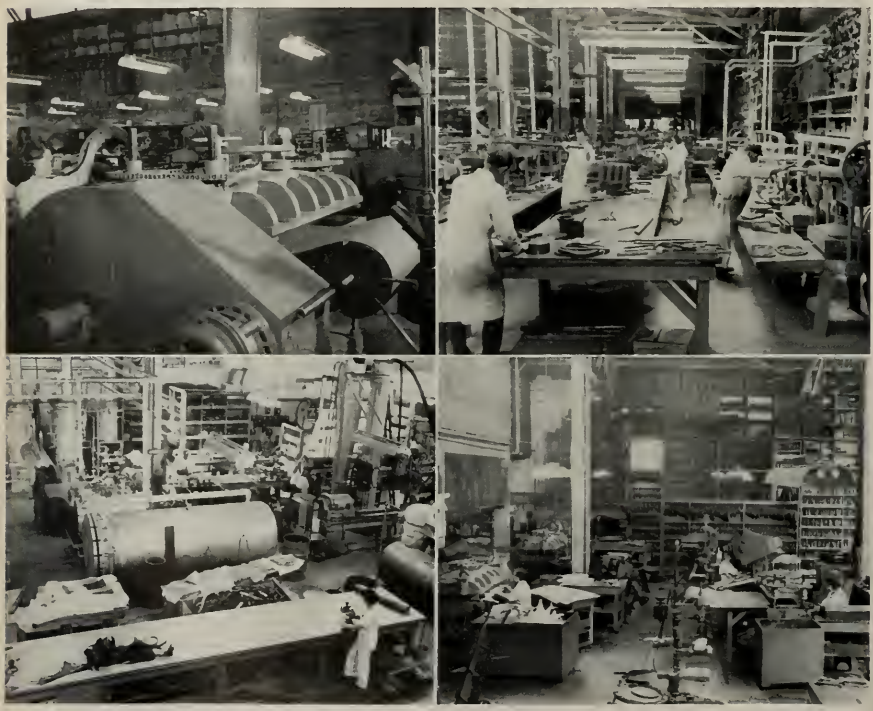
A Modern Marine Gasket Factory

For over 25 years Hercules Equipment and Rubber Company, and more recently its associated manufacturing divisions, have been supplying a very essential service to the marine, oil and many other industries on the Pacific Coast.

Monroe Paulsen, the owner of this company, acquired the present site and building at 435 Brannan Street, San Francisco, in 1941, and equipped it with the most modern machinery for the manufacturing of industrial rubber goods and gaskets of all kinds. The plant occupies an area of about 50,000 square feet, and the layout, construction, storage and other features are designed to facilitate prompt and accurate handling of orders.

The gasket shop is the most modern

Upper left: Heavy duty press for cutting large gaskets. Upper right: Molded Rubber Goods Department. Lower left: Boilers, oven heaters and Grinding Department. Lower right: Punch Press Department and die storage racks.



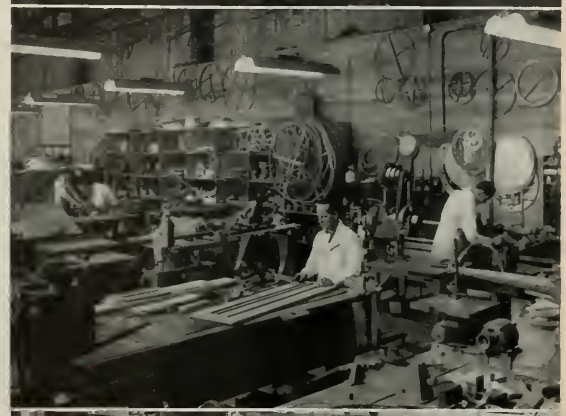
of its kind in the West where mechanical equipment for cutting, spinning, stripping, punching, or forming all types of material, including metal, felt, fiber, cork, rubber, asbestos, paper, and various synthetics is to be found. Metal encased gaskets up to seven feet in diameter, used in



Packing Department.

many heat exchangers for oil refinery use, and others of unusual shape, are produced by highly skilled operators, using horizontal forming machines of special design. The facilities and staff of this division have been taxed to the limit in taking care of the orders used in ship and marine engine equipment and repairs.

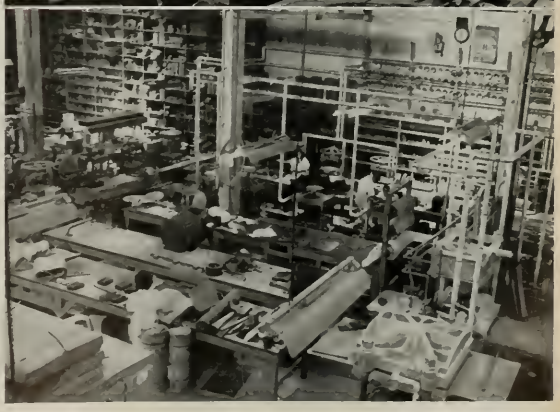
The Standard Rubber Co. is the division which manufactures all the strip and rubber molded goods, much of which is essential to the marine field. This division of the company



Lathe and Rolling Machine Department.

is under the supervision of Fred Banner. The complete manufacturing activities of the combined companies are managed by Al. Richardson.

The Hercules Equipment and Rubber Company also represents many Eastern manufacturers in the distribution of a complete line of hose, belting, V-belts, sheaves, packings, gaskets and other products used in the marine and industrial fields. In-



Molded Rubber Goods Department.

cluded in this list are the following companies: B. F. Goodrich Co.; Belmont Packing and Rubber Co.; Dixon Valve and Coupling Co.; France Packing Co.; O. P. Packing Co.; Wil-X Manufacturing Corp.; Toledo Timer Co.; Durabla Manufacturing Co.; and the D. B. Smith Co.

Marine Firm Gives Essential Services

The management and employees of the marine and industrial equipment firm of Thomas A. Short Co. of 245 Fremont Street, San Francisco, have contributed a very important service to the U. S. Navy, U. S. Maritime Commission, other Governmental agencies, and many Pacific Coast shipyards, in the distribution, installation, and servicing of marine diesels and other marine equipment used on board ships of all types, both large and small.

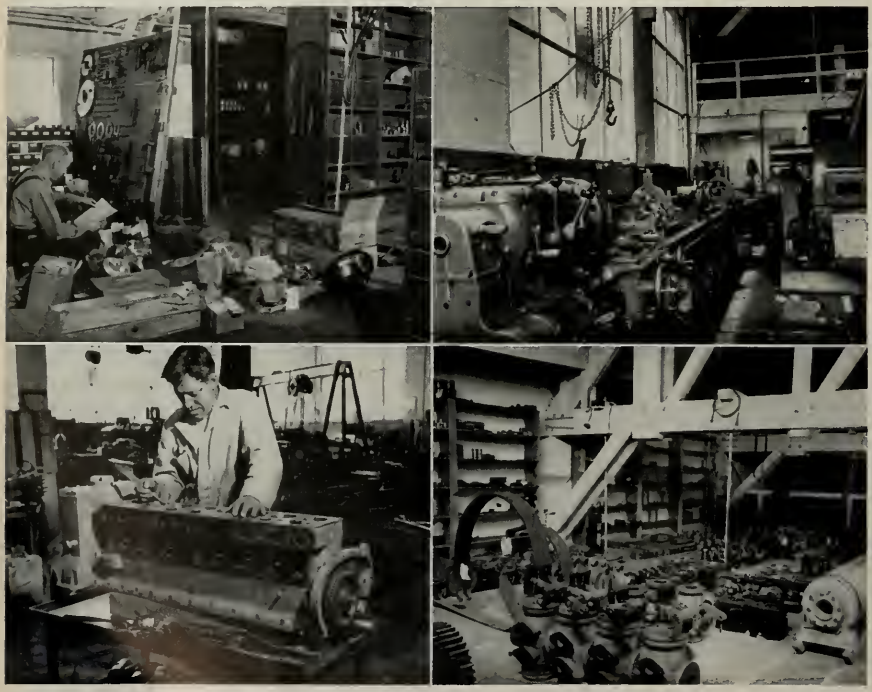
As exclusive dealer in the Bay Area for Caterpillar diesels, the company has installed many propulsion units of the above name and type in the tugs and fishing craft, and also many other units as auxiliaries on larger craft. The steam winches on all Liberty ships coming into the bay are repaired and serviced by the company's experts, since the company is the exclusive representative and distributor for the American Hoist and Derrick Company in this area. The company also supplies and services all steamship companies and shipyards in this district for the Vulcan Soot Blower Company's equipment, and many other makes.

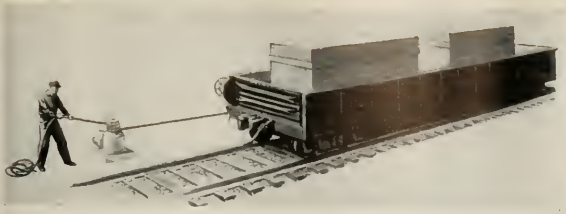
Another important wartime service given by the company's engineers is the supervision of repairs to Hyde hydraulic and electric steering machinery and deck machinery, as installed on many types of U. S. Navy battlecraft.

The firm also represents the Sedgwick Machine Works of New York City, who have supplied ammunition hoists for various types of combat vessels operated by the U. S. Navy.

The company in nowise competes with the shipyards, but acts as subcontractor at the request of the contractors and shipowners. A complete line of marine accessories of all kinds for small craft is carried, which includes pumps, filters, propellers, rubber bearings, horns, searchlights, and marine instruments of many types. In the rear of the office at Fremont Street is a modern building equipped as an up-to-date machine shop, complete in every respect for handling the varied types of service work performed.

Upper left: A portion of stockroom. Upper right: A corner of the Machine Shop. Lower left: Overhauling an internal combustion engine. Lower right: A corner of the stockroom, featuring steam winch parts.





Typical application of Lo-Hed car puller, showing how one man replaces an entire car-spotting gang.

New Car Puller

American Engineering Company, Philadelphia, manufacturers of Lo-Hed electric hoists, announce the introduction of their new Class 2½ Lo-Hed car puller—affectionately called the "One Man Gang."

This car puller is a husky hauling device in which the barrel, gear box and motor are integrated in a single streamlined unit. Starting line pull is 5000 lbs., using a single line, or more with various block combinations.

Uses of the car puller range from hauling railroad cars of all types to pulling skids, powering boat and airplane runways, dragging logs, bending pipe and numerous other back-breaking operations where imagination sees its possibilities.

Sealed Vapor-Proof Motor

A new, totally-enclosed vapor-proof and explosion-proof motor was announced recently by Electrical Engineering and Mfg. Corp., Los Angeles, California.

This splash-proof unit is adaptable for operation of winches, hoists, blowers, bilge pumps and other similar shipboard equipment. It is particularly useful for operations where gases are present or where prevention of damage from salt spray or sea corrosion is paramount.

The current model now being used by the Government is in the 2½-hp, D.C. continuous duty, double enclosed class. Integral gear reduction of 3.8 to 1 is provided, giving an approximate rpm output of 2400. Overload capacity is 150 per cent for about 15 minutes.

An internal fan cooling system is designed into the unit, with a built-in external fan forcing air over the heat exchanger tubes of the internal cooling system. The motor can be wound for either 32 or 110 volt D.C.



Complete Stock of Piston Rings for Liberty Ships

The Eugene V. Winter Co., district representatives for American Hammered Piston Ring Div. of Koppers Co., now have a complete stock of American hammered piston rings for all pumps, engines and winches on Liberty ships. This stock covers a range of sizes from 1¾-inch-diameter pump valve rings to the 70-inch-diameter low-pressure rings in the main engines. Deliveries can be made immediately from Eugene V. Winter Company's location at 15 Drumm Street, San Francisco.

Dyeing to Save

Over thirty per cent of those rescued at sea in the war owe their lives to the lifejacket "dye marker," a waterproof bag-full of Uranine, the sodium salt of fluorescein, manufactured by the Calco Chemical Division of the American Cyanamid Company.

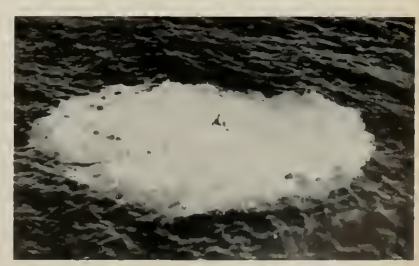
A pound of the dye will color approximately an acre of ocean a brilliant yellowish green, easily detectable against the dark background of the sea. The dye for hundreds of thousands of the markers has already been made by this company as standard equipment for rubber rafts and life jackets.

Other uses of the Uranine "dye markers" include dropping them from planes to mark for surface vessels the spot where an enemy submarine has been spotted from the air; depth charge markers, and "drift-signal" markers for both Army and Navy. Uranine dye is so powerful that one part of it is detectable in 16,000,000 parts of water.

The demand for this essential wartime product has been so great that Calco has been forced to utilize materials and equipment normally used for other products. For instance, the department which produces azo dyes, widely used in the textile, paper, gasoline, paint, food, drug and cosmetic industries, has produced the intermediate for Uranine at the sacrifice of its normal dye production. Compared to 1940 production, the 1944 production of Uranine by the company was expanded over 42,000 per cent.

Left: Sealed vapor-proof motor.

Right: Three minutes after pulling rip flap, showing wide dispersal of Uronine dye around an aviator.



On the Ways — SHIPS IN THE MAKING





"MILLION DOLLAR OPEN HOUSE" AT CALSHIP

Upper left: Watching the SS Amarillo Victory (at right) slide into the water are: J. M. Warfield, gen. mgr. of Calship; Mrs. Joe Jenkins, wife of Mayor of Amarillo, Texas; Miss E. Sorensen, maid of honor; Mrs. Eda C. Lahman, sponsor; Major Jae Jenkins, and Mrs. J. M. Warfield.

Below, left: Bing Crosby entertains at the War Bond open house on July 1. Everyone present had gained admission by purchase of a War Bond.

Calship Going Into Repair Field

John A. McCone, president of the California Shipbuilding Corporation, upon his return from Washington, D. C., announced Calship will handle repair and conversion of vessels of various types, both for the Navy and for the U. S. Maritime Commission. Work is expected to get underway by mid-July. Actual papers and contracts covering the repair operations, which will supplement the big Terminal Island shipyard's new-ship construction program, are now being processed, McCone said.

Repair work at Calship will be limited to facilities presently available and to additional facilities as they are vacated by completion of new-ship construction. McCone said that as many as possible of the shipyard's present employees will be utilized on repairs.

The announcement emphasized that the repair work will be carried on without interference with the present new-ship construction program.

Contract to Newport News

The U. S. Maritime Commission announced recently the award of a contract for the construction of three refrigerated cargo ships on behalf of the United Fruit Steamship Corp. of Boston, Massachusetts. The contract was awarded to the Newport News Shipbuilding and Drydock Co., in Virginia, lowest bidder on a fixed price basis in which no allowances are made for changes in costs of labor and material.

The twin-screw "reefers" are to be turbine driven at 16 knots or better, are 450 feet in length and have a capacity of 6500 d.w. tons.

The price of the vessels is to be $4,500,000 each and they are to be delivered 430, 470 and 510 days after the date of contract.

Some Pacific Coast Launchings From June 15 to July 15

California Shipbuilding Co. Terminal Island, Calif.

SS Rice Victory, June 16
SS Whittier Victory, June 20
SS Meredith Victory, June 23
SS Amarillo Victory, July 1
SS Pine Bluff Victory, July 7

Consolidated Steel Corporation Wilmington and Long Beach, California, Shipyards

MV Hickory Tor, June 16
MV Hickory Brae, June 22
MV Hickory Bourne, June 27

SAN FRANCISCO'S OWN

Destroyer, USS The Sullivans, speeds to the rescue of the burning aircraft carrier, the Bunker Hill, off Okinawa. The Sullivans was built at the San Francisco shipyard of Bethlehem Steel Company and in battle is identified by the shamrock carried on its forword stack.



MV Hickory Dell, June 29
MV Crossing Hitch, July 2
MS Coastal Conqueror, July 4
MS Coastal Rider, July 7

Kaiser Company, Inc., Yard 3, Richmond, California
SS Marine Swallow, June 21
SS Marine Perch, June 28

Kaiser Cargo, Inc., Yard 4, Richmond, California
MS Terminal Knot, June 23
MS Spool Sinnet, July 14

Marinship Corporation Sausalito, California
Tanker Huntington Hills, June 16
Tanker Wheeler Hills, July 14

Permanente Metals Corporation Yards 1 and 2, Richmond, California
SS Hillsdale Victory, Yard 1, June 23
SS Ripon Victory, Yard 1, July 3
SS Carthage Victory, Yard 1, July 14
SS Asbury Victory, Yard 2, June 16
SS Canton Victory, Yard 2, June 20
SS Lindenwood Victory, Yard 2, June 23
SS Enid Victory, Yard 2, June 27
SS San Mateo Victory, Yard 2, June 30
SS Greeley Victory, Yard 2, July 4
SS Berwyn Victory, Yard 2, July 7
SS Battle Creek Victory, Yard 2, July 11



OUTWARD BOUND

A General heads for war. Last of a series of sleek troopships built at U. S. Steel's Federal shipyard as she barely clears a 130-foot hoisted railway drawbridge on her delivery journey.

SS Great Falls Victory, Yard 2, July 14

Consolidated Launches Second Tuna Clipper

The Princess Anne, the second all-steel clipper to be built at Consolidated Steel Corporation's Boat Division was launched in Newport Harbor July 14.

Like its sister ship, the Princess Pat which was launched last May, the Princess Anne is being built for Otto C. Kiessig and Associates of San Diego.

DD-868 Replaces Warship Sunk by Japs

Ensign Caroline Brownson Hart, USNR, Wave and daughter of the Junior Senator from Connecticut, sent the heavy-destroyer USS Brownson (DD868) down the ways at Bethlehem's Staten Island shipyard, July 7.

Standing by Miss Hart's side when she smashed the traditional bottle of champagne across the warship's bow were her father, Admiral Thomas C. Hart, USN (Ret.), Senator from





INGALLS BEST

Top row, left: HMS Battler built for British. Right: Veteran of 5 major invasions, the attack transport USS Samuel Chase ("Lucky Chase").

Bottom row, left: Latest in A.T.'s, the USS Hampton. Right: USS Arthur Middleton survives 80 days on a reef in the Aleutians.











From part to stb'board: Destination Tokyo. A U. S. Steel Federal shipyard product, the destroyer USS Gearing, about to cast off on the first leg of her journey toward war. Navy's newest attack cargo ship, the Vermilion, being completed at Todd's Brooklyn yard. The largest U. S. Hospital Ship, the Army's Frances Y. Slanger, formerly the Italian luxury liner Saturnia, at Todd's dry dock at Brooklyn.

Connecticut, and her mother, daughter of the late Admiral Brownson and sponsor of the first vessel to bear that name.

The 108th wartime destroyer built by Bethlehem and the 40th launched by the Staten Island yard, was named in honor of the sponsor's grandfather, the late Rear Admiral Willard H. Brownson, USN, and thereby perpetuated the memory of the first destroyer USS Brownson (DD518) which was sunk by the Japanese during the American invasion of Cape Gloucester, New Britain.

West Coast Leads in Shipbuilding

With delivery of 107 ships of 1,010,519 d.w. tons in June, the merchant ship construction for the first half of 1945 stands at 693 ships of 6,959,254 d.w. tons. Furthermore, the U. S. Maritime Commission announced that this month marked the close of the standard Liberty ship program. However, a number of special military conversion and coal colliers adapted from the Liberty are yet to be delivered.

Location	Vessels	D.W. Tons	Per Cent
West Coast	46	466,453	46.2
East Coast	32	317,481	31.4
Gulf Coast	23	196,525	19.4
Great Lakes	6	30,060	3.0

Out of the total number of ships delivered, 14 went to the armed forces. In addition to the 14 military type vessels, those delivered during June include: 34 Victory cargo, 7 Liberty cargo, 4 Liberty colliers, 10 C-type cargo, 2 Refrigerated cargo, 27 Coastal cargo, 13 standard tankers, and 1 private tanker.

SHIPYARD	Number	Type
Alabama D.D. & Shipbldg. Co. Mobile, Ala.	3	T2 Tankers
Bethlehem-Fairfield Shipyard, Inc. Fairfield, Baltimare, Md.	9	Victary Carga
Bethlehem-Sparraws Paint Maryland	1	Private Tanker
Calship Wilmingtan, California	7	Victary Cargo
Consalidated Steel Carp. Wilmington, California	7	C1-M-AV1 Coastal Carga
Delta Shipbuilding Co., Inc. New Orleans, Louisiana	4	Liberty Calliers
Federal Shipbldg. & Dry Dock Co. Kearny, New Jersey	3	Military Type
Froemming Brathers, Inc. Milwaukee, Wisconsin	1	C1-M-AV1 Coastal Carga
Gulf Shipbuilding Corp. Mobile, Alabama	1	R2 Refrigerated Carga
Ingalls Shipbuilding Carp. Decatur, Alabama	1	N3 Coastal Cargo
Ingalls Shipbuilding Carp. Pascagoula, Mississippi	2 1	C3 Carga Military Type
J. A. Janes Canstructian Co., Inc. Brunswick, Georgia	2	C1-M-AV1 Coastal Cargo
J. A. Janes Canstructian Co., Inc. Panama City, Florida	3	Liberty Cargo (boxed plane carrier)
Kaiser Carga, Inc. Shipyard No. 4 Richmand, California	2	C1-M-AV1 Coastal Cargo
Kaiser Company, Inc., Shipyard No. 3 Richmand, California	1	Military Type
Kaiser Swan Island Yard Portland, Oregan	4	T2 Tankers
Kaiser Campany, Inc. Vancauver, Washington	1	Military Type
Leathem D. Smith Shipbldg. Co. Sturgean Bay, Wisconsin	2	C1-M-AV1 Coastal Carga
Marinship Carparatian Sausalita, California	2	T2 Tankers
McCloskey & Campany Tampa, Florida	5	N3 Coastal Carga
Moore Dry Dock Campany Oakland, California	3 1	C2 Carga R2 Refrigerated Carga
North Carolina Shipbldg. Co. Wilmington, North Carolina	4	C2 Carga
New England Shipbldg. Carp. Sauth Portland, Maine	4	Liberty Carga
Oregan Shipbuilding Carp. Portland, Oregan	8	Victary Carga
Pensylvania Shipyards, Inc. Beaumant, Texas	2 1	R1-M-AV3 Coastal Cargo C1-M-AV1 Coastal Carga
Permanente Metals Carp. Richmand, California	10	Victary Cargo
Sautheastern Shipbldg. Carp. Savannah, Georgia	1	C1-M-AV1 Coastal Carga
Sun Shipbldg. & Dry Dock Co. Chester, Pennsylvania	4 1	T2 Tankers C4 Carga
Walter Butler Shipbuilders, Inc. Superiar, Wisconsin	2	C1-M-AV1 Coastal Cargo
Walter Butler Shipbuilders, Inc. Duluth, Minnesata	1	C1-M-AV1 Coastal Carga
Walsh-Kaiser Co., Inc. Providence, Rhode Island	3	Military Type

Commissioning of the USS Rodman

The USS Admiral Hugh Rodman, newest Navy P2 troop-transport, was commissioned July 10. During the ceremony Mrs. Sue Rodman Merriman of San Francisco, niece of the late Admiral, presented Captain Lewis E. Coley, USN, a picture of Admiral Rodman and a personal ash tray which had accompanied the Admiral since 1919.

Captain Lewis E. Coley, USN, of Oklahoma City, Okla., assumed command of the troop-transport after Commodore Robert G. Coman, USN, director of Transportation & Shipping Control for the Western Sea Frontier, turned over the vessel at Bethlehem-Alameda Shipyard, Inc. Captain Coley has had over 25 years of naval service during which time he commanded the Yangtze River gunboat Oahu and the Destroyer Alden. He was awarded the Navy Cross for distinguished action in the battle of the Java Sea.



Mrs. Sue Rodman Merriman, niece of Admiral Hugh Rodman, presents Captain Lewis E. Coley, USN, with a picture of the late Admiral and a personal ash tray which had accompanied the Admiral since 1919, after the commissioning ceremony held at Bethlehem - Alameda Shipyard, Inc.

Three San Francisco Bay Area naval officers are included in the ship's personnel. They are: Lt. Bernard F. Trimpe, USNR, of Berkeley; Lt. Leo L. Miller, USN, of Burlingame, and Ensign Edwin F. Halloran, Jr., USNR, Belvedere, Marin County.

Admiral Rodman, for whom the vessel was named, is well remembered in the San Francisco Bay Area, having had command of the Mare Island Navy Yard as Captain Rodman in 1910 and 1911.

He was made Admiral and Commander-in-Chief of the Pacific Fleet on July 1, 1919, and later won the acclaim of the Bay Area press and public by personally piloting his fleet through the Golden Gate Strait on an official visit. During World War I, he commanded the American Battle Squadron with the British Grand Fleet. He retired in 1922 and died in 1940 at the age of 81.



Propellers such as this mave invasian ships battling in the Pacific to defeat Japan. Shown here is a 12-foot, 3-inch destroyer propeller being hoisted for a test in U. S. Steel's Federal shipyard at Kearny, New Jersey.

Rust Awarded Navy Furnace Contracts

The Navy Department has awarded Rust Furnace Co., Pittsburgh, Pennsylvania, a contract for a stress relieving furnace equal in size to the largest ever built, which was also recently designed by Rust for naval use. The new furnace will have the additional characteristic of being a moveable unit, capable of ready disassembly and reerection in different locations.

Destined for Hunters Point, Cal., for stress relieving the heaviest battleship turrets, the big stress reliever will be 48 ft. wide by 56 ft. long by 30 ft. high. It will be indirect-fired with forced recirculation of hot gases, being equipped with two outside independent combustion chambers and two recirculating units.

Contract for another stress relieving furnace for Hunters Point, direct-fired car-type, has also been awarded Rust by the Navy. The two contracts total somewhat less than $200,000.



A busy yard on the Willamette. The Northwest Marine Iron Works of Portland, Oregon. At right: Pivotal point in a launching, bow on land and stern at sea, at Port Newark, N. J., shipyard of Federal. The destroyer Kenneth D. Bailey beginning to float at the stern while still sliding down the ways.

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
MARINE UNDERWRITERS
200 BUSH STREET . . . . . SAN FRANCISCO
Offices at: Colman Bldg., Seattle • 111 West 7th St., Los Angeles

Technical Illustration Methods

(Continued from page 449)

(c) guarantees coordination of design practice and construction procedure along definite lines;

(d) advances new production methods;

(e) serves as an adjunct to shop experience;

(f) eliminates the necessity of verbal formulae;

(g) saves precious time in all-out production;

(h) enables master craftsmen from a different field to get the "feel" of the new environment and to adapt themselves to the changed conditions.

Therefore the logical conclusion is that pictorial illustration became an important contributing factor in establishing the "Calship" wartime shipbuilding record.

The Harvard Report

(Continued from page 437)

(D) SALES PROCEDURE. Ships should be offered for sale immediately at end of the war. Ships, except Libertys, T-2's and those over 15 years old should be offered for sale at the above prices to prospective purchasers in the following order: (a) Contractual obligations. (b) United States flag operators. (c) Reserve Fleet Maintenance Corporation for Balance Reserve. (d) Foreign flag operators. Libertys, T-2's and ships over 15 years old should be offered to all purchasers, both domestic and foreign, simultaneously.

(E) CHARTER. Liberty ships and ships over 15 years old should be made available for charter as soon as for sale. Other type ships should not be chartered until they have been offered for sale to all classes of purchasers and have not been sold. The charter price should be sufficiently high, as compared with the sales price, so that long-term chartering is discouraged.

(F) SHIPS NOT SOLD OR CHARTERED. The good ships which have not been sold or chartered under the above procedures should be sold to the Reserve Fleet Maintenance Corp. for the residual reserve. Remaining ships which are in need of substantial repairs or whose usefulness is doubtful should be scrapped.

(G) TERMS. (1) Terms of payment should differ as between U. S. and foreign purchasers. Foreign purchasers should be required to pay cash, but U. S. operators should be allowed either cash or installment terms. (2) No restrictions on operations should be included in the sales agreements with the purchasers. (3) No agreement giving the Government the right to recapture a ship in case of emergency should be included in the sales contract. (4) U. S. citizens who purchase and operate ships under the U. S. flag should have the privilege of returning the ships to the Maritime Commission at purchase price less depreciation at 5 per cent per annum to the date of return provided they agree to build a new ship to replace the one returned.

From the American shipowners' viewpoint, this report has the advantage that it recommends a firm pricing and scrap or lay-up policy which, if adopted, will end much of the uncertainty that has plagued the industry. Prices will be firm but the ship will be ready for sea when delivered.

It may be assumed that the final resultant legislation on ship sales will be something between the present draft and this report.

Appointment

The Bay Cities Asbestos Company of Oakland, California, announces the appointment of Edward Dorresten as general manager of the company.

Mr. Dorresten received his engineering education at Cal. Tech. and Stanford, graduating from the latter school in 1924.

Since that time he has held successively the following positions: District Manager of C. F. Braun & Co., manufacturing mechanical engineers on gasoline plants erected at Tulsa, Oklahoma; Design and Sales Engineer in charge of the West Coast office of E. B. Badger & Sons Co., chemical engineers of Boston. Previous to the outbreak of war he was engaged in supervising the erection of refineries in Europe, and on his return to this country in 1939 Bechtel McCone Co. appointed him vice president in charge of their San Francisco office. Here he was in charge of refinery and power plant construction, and at one time handled all foreign contracts, including those in Bahrein and Arabia.

BOOK REVIEW

Medical Care of Merchant Seamen

This book is an invaluable handbook of ship and aircraft sanitation, written by W. L. Wheeler, Jr., M.D., Medical Director, Grace Line, Inc. (Published by Cornell Maritime Press, New York—Price $2.00.)

Doctor Wheeler's long acquaintance with maritime medicine makes him well suited to the task of writing such an urgently needed emergency first aid book. However, it is not intended as a substitute for professional medical assistance. Dr. Wheeler is gifted with the faculty of writing clearly, in a layman's language. He discusses recognizable symptoms and gives practical remedies based on actual experience for many diseases foreign to the United States. For those pharmacists mates and others who are pinch-hitting for doctors abroad many of our merchant vessels he has provided the needed facts for medical care from the cradle to the grave.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

"SEMPER PARATUS" for these 155 Years

The United States Coast Guard, oldest commissioned service in the nation, celebrated its 155th birthday on August 4 in a way the Japs didn't like.

Out in the far Pacific invasion fronts Coast Guardsmen commemorated the occasion with renewed blows at the enemy.

Their major assignments on the European front finished, they have marked another year of putting their fighting surfman's skill into difficult amphibious landing operations against the Japanese; manning troop, assault and supply ships; performing escort and convoy duties. Withal, they are not neglecting their traditional peacetime activities of protecting life and property on the seacoasts and waterways, or their vital wartime assignments on Port Security.

Today, the 170,000 men and women wearing the Coast Guard shield on their right forearm have earned commendations from ranking Army, Navy and Marine officers, as well as from government, state and municipal officials.



Crammed with men and materiel for the invasion of Cape Glaucester, New Britain, this Coast Guard Manned LST (Landing Ship, Tanks) nears the Japanese held shore. Coast Guard and Navy manned LSTs participated in the operation. Troops shown in the picture are Marines.

●

Strange sights to be seen and Coast Guardsman Floyd D. Barnard, 23, Boatsman's Mate second class, has seen them on the floor of the Pacific since he has been the ship's diver while serving aboard a Coast Guard Cutter.



While performing vital Port Security duties on the home front—vastly increased with San Francisco Bay now the main funnel for shipment of men, munitions and supplies to Pacific fighting fronts—the Coast Guard is continuing to write a brilliant chapter in combat zones.

In every major invasion since the sneak Jap attack on December 7, 1941—be it North Africa, Sicily, Salerno, Normandy, Guadalcanal, Tarawa, Leyte, Iwo Jima or Okinawa—fighting men with "USCG" emblazoned across their steel helmets have manned tiny landing craft darting from giant transports to enemy shores.

With a minimum of fanfare, the Coast Guard has performed its important war-time services. Few know that this was the first American service to take German prisoners in this war; that a Coast Guardsman, helping in the rescue of Marines trapped behind enemy lines at Guadalcanal, won the Congressional Medal of Honor posthumously; that a Coast Guardsman was responsible for the capture of the saboteurs who landed on Long Island from a Nazi submarine; that a Coast Guard "Splinter Fleet"—made up of small 83-footers originally designed for inshore patrol—rescued more than 800 survivors of ships blasted by enemy fire at Normandy.

(Please turn to Page 84)



Bilge Club Annual Outing

R. W. "Duke" Decker, master of the Bilge Club of Southern California, piped all hands aboard for the 16th Annual Cruise for Bilgers and their guests Saturday, June 23, at historic Palos Verdes Golf Club.

From dawn to dusk 650 Bilgers relaxed and enjoyed the many activities and "facilities" which had been made available by efficient committees.

In charge of the golfing was Charley Houghton. The Port and Starboard baseball teams were assembled under the watchful eye of John Zanello. Umpire for the strenuous contest, which resulted in a draw, was T. W. "Buck" Buchholz, who is well on his way to being the permanent arbitrator for this annual clash.

Supervising the tug of war was E. L. Archibald. Anchor men for the opposing teams had best be nameless.

As tradition now has it the four-hour barbecue feast stole the show! Chief Steward was Walter Richards, Sr., aided and abetted by a quintet of chefs whose culinary skill puts to blush the cuisine of Adolph of The Ritz.







Top, left: Bilge President, "Duke" Decker, officially welcomes Herb Pickering, new prexy of Propeller Club of Los Angeles-Long Beach Port.

Center: Secretory Robert (Bob) Snadgrass and his efficient aides.

Bottom, left: E. L. Archibald, marine superintendent of Sunset Oil Company, and his son, Captain William J. Archibald, who has just returned from 15 months in Italy as pilot of air troop carriers.

Group photographed at right are enjoying the barbecue and golf tourney.

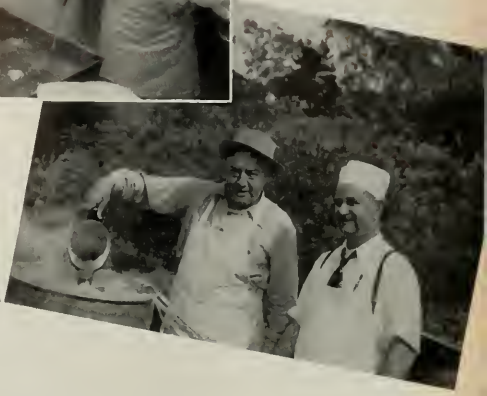












PMR's ubiquitous photographer, M. Duke Lanfre′ of Los Angeles, staged these photographs for the record. Bilgers, do you recognize yourselves?





















Top, left: Although the USS Sylvonio, recently commissioned combat - cargo vessel, wos named after the plant, employees of Sylvonio Electric Products, Inc., took an interest in the ship ond presented the crew with o radio-phonograph set. Here, Lt. Comdr. F. O. Bryce, skipper, is receiving the order for the set from Robert R. Wylie, commercial engineer of Sylvonio, during the christening ceremonies.

Top, right: Sponsor's porty ot the launching of the SS San Moteo Victory at Yord 2, Richmond. Mrs. Arthur O. Brody, wife of Commanding Officer of the Merchont Marine Basic School at San Moteo, christened the vessel on June 30. Left to right: Flower Girl Morilyn Schade, Mrs. E. G. McDonold, motron of honor; the sponsor; triggerman ond speoker, Commander Arthur O. Brody.

The above four pictures ore of the instollotion ceremony ot the Port of Los Angeles - Long Beach when Herbert Pickering wos honded the gavel by Retiring President, Lee K. Vermille. The group pictures show the committeemen ond officers for the 1945 term.

Have You Met "Eddie" Martin?



W. Edgar Martin is assistant manager of the Marine Department for the Pacific Coast District of the Westinghouse Electric Corporation, San Francisco.

He has been deep in the ocean on test dives, checking electrical equipment for noise that might betray a submarine's presence to the enemy; he has been high in many a crow's-nest, admiring the sleek beauty of some mighty ship which he has helped to equip with steam propulsion machinery and electrical apparatus. But mostly, aboard ship, you'll find him in the engine room, for he's fond of engine rooms.

He's W. Edgar "Eddie" Martin, youngish appearing veteran of more than 23 years' service to the marine industry on the Pacific Coast, and for the past 30 years a marine representative for the Westinghouse Electric Corporation.

Eddie has been assistant manager of the Marine Department for the Pacific Coast District for the past four years. In his present job Martin coordinates service, sales and engineering work on virtually all Westinghouse products going to the marine industry. He deals in everything from steam turbines and gears totaling 200,000 hp for capital ships, down to 200 hp equipments for fishing boats. From Seattle to San Diego, he has helped meet the pressing wartime needs of shipbuilders, operators, repair yards, and the Navy. He's busy—and he takes to it, his friends say, like a Martin takes to water.

A dangerous job? Well, not necessarily, says he, although he reluctantly admits having fallen off a dredge at New Orleans. He got wet, he recalls.

Hectic? Certainly! But on the less serious side he remembers vividly one recent race against time that almost got him an unplanned trip to Hawaii. He had been inspecting a repaired turbine generator set on an LSD when he felt the ship moving from the dock. He raced to the deck to find the ship already too far away from the dockside to permit even a superhuman leap. But Martin didn't go to Honolulu, although it was close. Instead a deckhand quickly swung him across the gangplank-less space between dock and ship, via a handy cargo crane. He was still in San Francisco, albeit perilously close to the outer end of the Pier when he landed feet first.

Thrills? Among his favorites are those test runs on the "more than 30 knots" destroyers, the crash stops, figure 8's, sharp turns at high speeds, aboard the ships he helped equip with electrical or steam turbine propulsion equipment.

As a charter member of the Westinghouse Marine Department, he helped pioneer the now well-known and widely used diesel-electric drive. He believes that it will be more widely used in post-war shipping days to come.

A native of Brooklyn, N. Y., and an electrical engineering graduate of the University of Colorado at Boulder, Colo., he joined Westinghouse in 1915 at East Pittsburgh, Pa. Following graduate student training there, he joined the company's newly formed Marine Department, and was instructor in the Westinghouse Technical Night School. In 1920, he took further post graduate work at Carnegie Institute of Technology. And in 1922 he was transferred to San Francisco as the company's marine representative.

Author of various technical and semi-technical papers and articles on marine subjects, Mr. Martin has also found time for other activities he believes of major importance to the marine industry. He served for three years as a member of the Board of Governors of the Propeller Club of California, now the Mariner's Club of California. He is a member of the Board of Governors of the Propeller Club of the United States, Port of San Francisco, and also holds membership in the Society of Naval Architects and Marine Engineers and the San Francisco Commercial Club. At various times he has served on the Naval Affairs and Shipbuilding Committees of the San Francisco Chamber of Commerce.

Hobbies? Whenever he has time for them, which is seldom, they're table tennis, golf (he's partial to the late 80's)—and ships!

This brief size-up of Eddie Martin wouldn't be complete these days without mention of what to him has become a veritable crusade. It's simply: "This time, let's **keep** our Merchant Marine."

"Today the United States has the biggest, best merchant marine in the world," Martin says. "It's insurance against future wars and—provided we've sense and foresight enough to keep it—should be a major factor in providing jobs and insuring post-war prosperity for our entire nation. The taxes of all our people are paying for this mighty armada. Let's not repeat our World War I blunder. Let's not give it away, sell it or allow it to rust and rot, after World War II."



Dignitaries of the United States at UNCIO were present at Richmond yards launchings. Left: Mrs. Edward R. Stettinius, Jr., sponsor of SS Phillips Victory on May 26. Center: Triggerman and sponsor of the SS New World Victory are Senator (Michigan) and Mrs. Arthur H. Vandenberg. Right: At the trigger is Commander Harold E. Stassen with Mrs. Stassen, the sponsor and Henry J. Kaiser, just before the SS Adelphi Victory slid down the ways.



Mme. T. V. Soong ready to swing the christening champagne at the SS Grove City Victory. The sponsor is the wife of T. V. Soong, then China's Minister of Foreign Affairs, and chairman of his country's delegation to UNCIO.



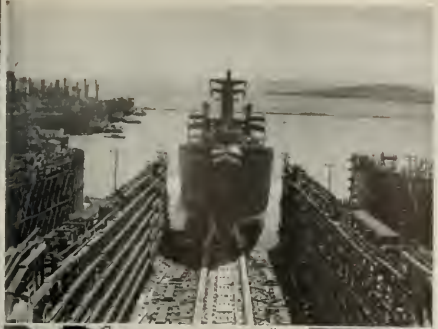
Below: Mrs. C. T. Feng christening the SS Drake Victory as Miss Doreen Feng holds the sponsor's bouquet. Mrs. Feng is the wife of San Francisco's Chinese Consul General and assistant secretary to the Chinese delegation at the Conference.

International Launchings at Richmond

With over seven hundred of their ships now plying the sea lanes of the world, the shipbuilders of Richmond, California, were hosts during recent months to representatives of many of the countries which these vessels serve.

Throughout the period of the United Nations Conference at San Francisco, international good will marked the launching events at the yards of The Permanente Metals Corporation and of Kaiser Company, Inc., in which distinguished visitors from many lands participated in the colorful and impressive ceremonies.

The SS New World Victory, serving as the symbol of triumph and security, was especially dedicated "to the coming era of lasting peace, understanding, and friendship among all freedom-loving peoples to issue from the United Nations Conference on International Organization."





At left: The SS Phillips Victory as she slides down the ways at Yard Two, Richmond Calif.

Below: left to right: Senator Tom Connally, triggerman; Mrs. Tom Connally, sponsor; Henry J. Kaiser, host; Mrs. Joseph A. Rogers, matron of honor; Chaplain C. J. Keliher, who delivered the invocation; Susan Craven, flower girl.

At right: British Delegation, top to bottom: Viscountess Cranborne, wife of Right Honorable Viscount Cranborne, Secretary of State for Dominion Affairs of the United Kingdom delegation.

Triggerman and sponsor Mr. and Mrs. J. R. Jordaan (he is Charge d' Affairs ad interim of the South African Legation at Washington).





Below, extreme left: The Right Honorable and Mrs. Herbert Vere Evatt. He is Attorney General and Minister for External Affairs for the Commonwealth of Australia. At right: Henry J. Kaiser with His Excellency and Mme. Abdel Hamid Badawi Pasha of Egypt. Below: Mushka and Matthew, the children of President Benes of Czechoslovakia, presenting flowers to Mme. V. S. Hurban, wife of Czechoslovakian Ambassador to the United States. Above, right: Wife of the Norwegian Consul, Mrs. Lars J. Jorstad. Below: Henry J. Kaiser with Mme. Henri Bonnet, sponsor, and His Excellency Georges Bidault. Sponsor's husband is French Ambassador to Washington, D. C.











SAN FRANCISCO 1945
THE UNITED NATIONS CONFERENCE ON INTERNATIONAL ORGANIZATION







SOME OF THE SOUTH AMERICAN DELEGATES AT RICHMOND LAUNCHINGS

Left to right: Senora Guillermo Belt greet guests as His Excellency Guillermo Belt ques tions Clay P. Bedford on shipyard production just before the launching of the SS Allegheny Victory. The sponsor is wife of Cuba's Ambas sador to United States and chairman of his country's delegation to UNCIO.

Center: Sponsor of the SS Hills Victory, Se nora Raquel de Guzman-Cruchaga, and trig german, His Excellency Joaquin Fernandez. The sponsor is wife of The Honorable Juan Guz man, Consul of Chile at San Francisco. Dr. Fernandez is Minister of Foreign Affairs for Chile, and chairman of his country's delega tion to Conference.

Right: His Excellency and Senora Alberto Lleras Comargo, during the launching ceremony of the SS Asbury Victory. The sponsor is wife of the Minister of Foreign Affairs for Colombia.

Around the Yards



SIR AMOS VISITS AMERICAN SHIPYARDS

Sir Amos Lowrey Ayre, prominent British ship building official, is shown an elevated plat form during a recent visit to Ingalls yards at Pascagoula, Miss. Left, in sunglasses, is R. I. Ingalls, Jr., vice chair man, and center, A. M. Seigert, works supt., who accompanied Sir Amos on his tour of in spection.

S.S. Whittier Christened

Calship's 448 vessel, the Victory ship SS Whittier Victory, named for Whittier College in California, was launched on June 20, and sponsored by Mrs. Lee K. Vermille of Los Angeles.

Mrs. Vermille is the wife of the past president of the Port of Los Angeles-Long Beach, and National Vice President of the Propeller Club of the United States. Her daughter, Miss Shirley Vermille, was maid of honor.

Dr. William C. Jones, president of Whittier College, represented the institution and gave a short address.

PROPELLER CLUB MEMBER'S WIFE LAUNCHES CALSHIP YESSEL

At right: Herbert Pickering (at left), new president of the Los Angeles-Long Beach Propeller Club, with Mr. and Mrs. Lee K. Vermille at Calship for the launching of the S.S. Whittier Victory which Mrs. Vermille christened.

Below: Included in the launching party of the S.S. Whittier Victory are, left to right: Miss Shirley Vermille, maid of honor; Dr. William C. Jones, president of Whittier College; the sponsor; Aubrey Wardman, member of the Board of Trustees of Whittier, and Mrs. Wardman.







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SHIPS of all services and sizes have absorbed terrific punishment, with little time out for repairs, in their never-ending job of keeping supplies moving. Many of them need major attention right now and the number will increase steadily. Tube-Turn welding fittings are ready for this big job.

In the complete Tube Turns line, there are more than 4,000 items to meet every marine requirement. Tube Turns distributors in every big shipbuilding center maintain ample stocks to fill most orders on the spur of the moment, and in every case there is a Tube Turns branch near at hand to take care of exceptional needs.

For the extra strength and lightness, the uniform wall thickness and high efficiency which have made Tube-Turn welding fittings famous throughout the maritime world, specify genuine Tube-Turn products for all welding fittings in all repair work.

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Shoreside Personalities

ANNOUNCEMENT.—JOHN G. THOMPSON is now located at 70 Atlantic Avenue, Brooklyn, New York. His firm handles a complete line of marine supplies in stock for a better service to steamships, shipyards, and allied marine industries.

A. F. WAKEFIELD ELECTED PRESIDENT OF I.E.S. Mr. Wakefield, president of the F. W. Wakefield Brass Co., Vermilion, Ohio, manufacturers of lighting and signalling equipment for the Navy, has been elected president of the Illuminating Engineering Society, it was announced by Society headquarters recently. He will take office October 1.

GEAR MANUFACTURERS APPOINTS GENERAL MANAGER. Farrel-Birmingham Company, Inc., has announced the appointment of Robert M. Honegger as general manager of the gear plant at Buffalo, N. Y. He first became associated with the Farrel organization in 1925 and in 1935 he was made general foreman. Shortly after he became plant superintendent, the position he held until the present appointment.



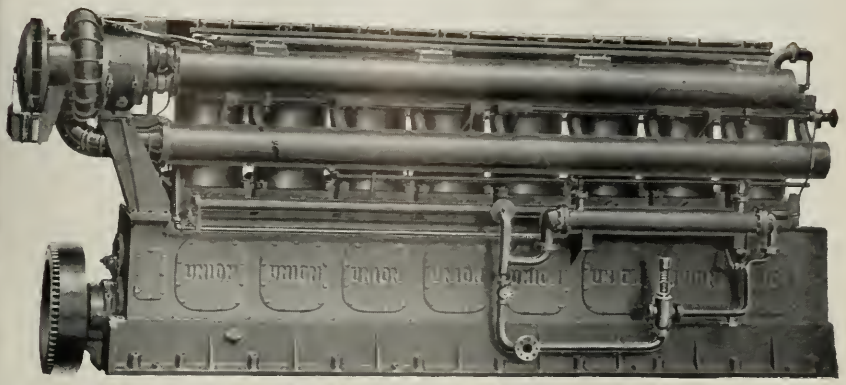
R. M. Honegger, general manager of Farrel-Birmingham Co.

U. S. PLYWOOD CORPORATION HAS FORMED an Industrial Adhesives Division with W. Robert Goepel manager. The headquarters will be in the company's main office at 55 West 44th Street, New York. In this division there will be a separate department on Plobond, a new all-purpose plastic adhesive developed by Goodyear. This department will be manager by E. A. Filley, formerly with Goodyear's plastics and coatings division.

W. S. A. CONSOLIDATION. War Shipping Administration announces that the Insurance Section and the Admiralty Claims Section have been merged and that Edward A. Neily has been appointed to handle the combined units with the title of Assistant General Counsel.

Substantially all of the Washington staff of the Admiralty Claims Section will be moved to New York, operating out of 99 John Street.

PASCAGOULA TO PUGET SOUND. A. C. Miccia, who was employed by the Ingalls Shipbuilding Corporation, Pascagoula, Miss., is now associated with the War Shipping Admistration in Seattle, Washington. He was head of the material coordination department of the Ingalls yard until he resigned to assume his WSA post on July 1.



UNION *Supercharged* DIESELS

Based upon years of research and experience with various types of superchargers, The Union Diesel Engine Company fitted to one of its engines the first turbo-charger ever sold in the United States for heavy duty marine application.

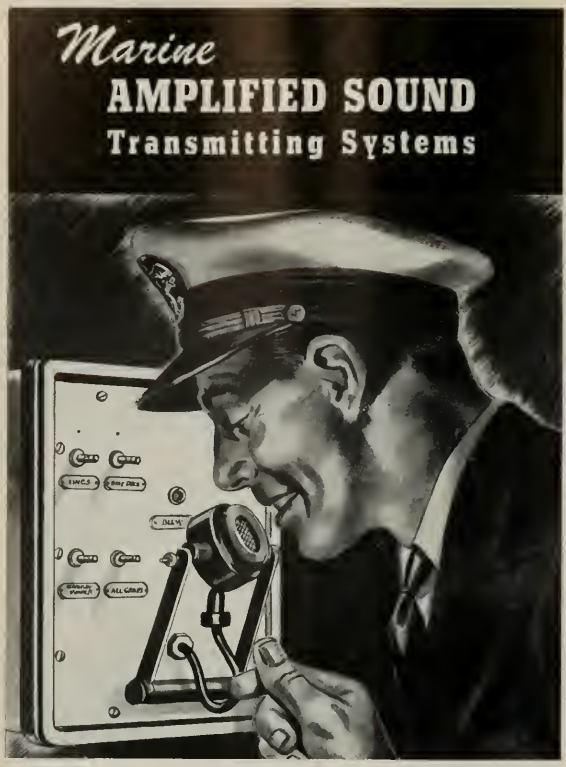
Any **UNION** Diesel can be supercharged. Any method of supercharging can be used. The satisfactory service delivered by **UNION** Supercharged Diesels is attested by the repeat orders received from their owners.

If you want to increase the efficiency and power of your present **UNION** Diesel, or if you contemplate the installation of a Diesel power plant for ship propulsion, auxiliary or stationary service, we invite your inquiry.

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Announcing & Communication Equipment

Manufacturers of Marine Communication Equipment Since 1918

DECONHIL SHIPPING COMPANY'S NEW PORT CAPTAIN. Captain V. Paul Marshall, who has been associated for over fifteen years with the Deaconhil Shipping Co.,



Captain V. Paul Marshall, new port captain for Deconhil Shipping Company.

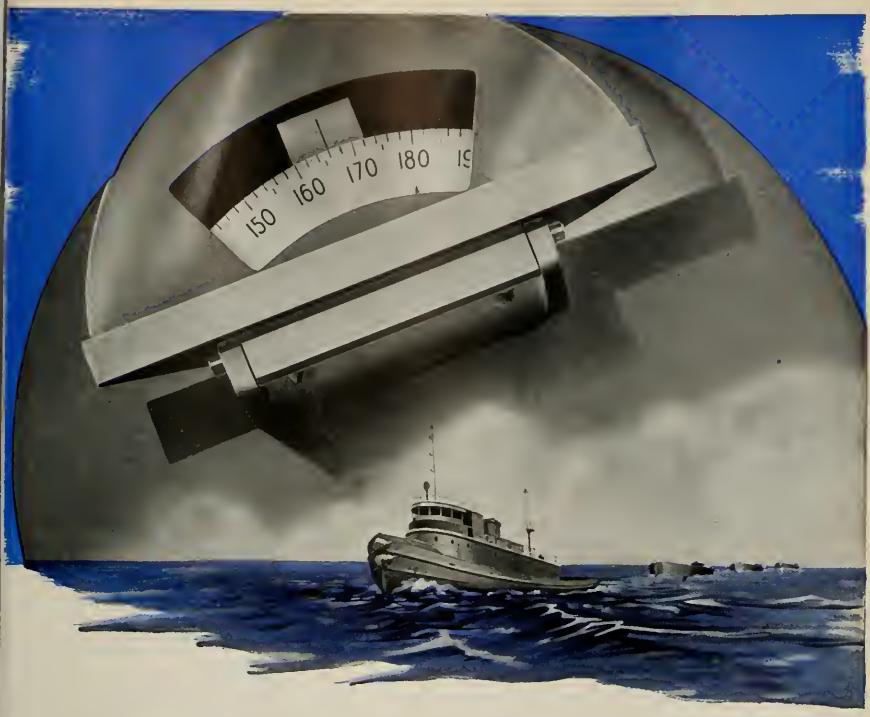
was recently appointed port captain. Since the outbreak of war he has spent eleven months on the Atlantic and for over two years was in command of several tankers on the South Pacific run.

He was attached to the U. S. Navy from 1917 to 1921 and holds a Lieutenant Commander's commission in the U. S. Naval Reserve. His early seafaring days were spent on the Cuban Distilling Co. tankers on the West Indies run.



James L. Ray.

JAMES L. RAY NAMED TURBINE DEPARTMENT HEAD. Appointment of Mr. Ray, widely-known steam and gas-turbine engineer, is announced by George F. Gayer, chief engineer of the Joshua Hendy Iron Works, Sunnyvale, California. Ray will head the company's gas and steam-turbine engineering department in San Francisco and supervise the expansion of its technical staff.



Introducing a new compass for small vessels

HERE at last is a navigation instrument for vessels requiring something better than a magnetic compass . . . vessels where space, weight, and power limitations make it impracticable to use the Gyro-Compass.

Sperry announces the Gyro-Magnetic Compass, designed particularly for small craft: fishing boats, seagoing tugs, towboats, barges, work boats, yachts, and ferries.

The Sperry Gyro-Magnetic Compass is a remotely located magnetic compass from which gyro-stabilized indications are transmitted to conveniently located repeaters.

The magnetic compass unit can be located where magnetic disturbances are at a minimum. This solves many of the serious deviation difficulties inherent in the magnetic compass.

Also, its gyro-stabilized indications as shown on the repeater compass are steady . . . regardless of the vessel's rolling and pitching.

The Gyro-Magnetic Compass can, in addition, be used to control automatic steering.

Subject to government priorities, this equipment will be available commercially toward the end of the year. Write our Marine Department for further information.

SPERRY GYROSCOPE COMPANY, INC. GREAT NECK, N. Y.

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XZIT

Cleans Out Soot and Fire-Scale

Eliminates Sparking

Extinguishes Stack Fires

XZIT not only gets rid of soot and fire-scale from fire-box to top of stack, but checks further carbon deposits. This scientifically compounded chemical, which is fed into the fire-box while the boiler remains in full operation, reduces the residual deposits of combustion, prevents sparking, and puts out stack fires instantly.

Continued use of XZIT prevents further deposits, pitting and corrosion. The cost of XZIT is insignificant, compared with the time, labor and fuel it saves.

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SPERRY GYROSCOPE COMPANY'S ASSISTANT MARINE sales manager is R. E. Erbentraut. He joined the Field Service department of Sperry Company shortly after his graduation from the Naval Academy with a Bachelor of Science degree in engineering. Prior to that he had studied electrical engineering at Kansas State College and Manhattan. He served as marine service engineer on a wide variety of assignments before being placed



R. E. Erbentraut, assistant sales manager for Sperry Gyroscope.

in charge of the marine service office at Boston, in 1942.

In his new position, Erbentraut will assist Marine Sales Manager O. B. Whitaker in directing the company's marine activities. His professional memberships include Society of Naval Architects and Engineers; the American Society of Naval Engineers; and the Port of New York, Propeller Club of United States.

CONSOLIDATION OF REGIONAL OFFICES. The U. S. Maritime Commission has announced the consolidation of two regional offices, Gulf-Great Lakes and East Coast, and to be under one director, L. R. Sanford. He is well known to shipbuilders on all coasts. Formerly Mr. Sanford was director of the Gulf-Great Lakes region since consolidation of these two areas in May, 1944. Prior to that time he was director of the Gulf regional office.

Reduction of the ship construction programs on the Great Lakes and later on the Gulf Coast, has given him wide experience in the closing phases of the activity, the dismantling of facilities and other factors incident to the completion of the U. S. Maritime Commission's wartime program.

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SAN FRANCISCO ... Cordon Bros., 200 Davis St.—DAvenport 8590
VANCOUVER, B. C. ... Engineering Service Ltd., Birks Bldg.—Pacific 5634



Charles A. Butcher with Crocker-Wheeler.

CHARLES A. BUTCHER JOINS CROCKER - WHEELER. Mr. Butcher, formerly manager of the Pacific Coast manufacturing and repair department of the Westinghouse Electric Corporation, Oakland, California, has been appointed assistant general manager of the Crocker-Wheeler Division, Joshua Hendy Iron Works, Ampere, New Jersey.

A Fellow of the A.I.E.E., he is the author of several articles on automatic controls for power generation and on sub-station and distribution equipment. He is the inventor of a number of devices and control systems related to automatic switch gear.

THE NEWLY ESTABLISHED ENGINEERING SERVICE division of Tube Turns, Inc., is to be headed by Carl B. McLaughlin. This division is developing new applications for the company's welding fittings. McLaughlin was formerly associated with Tube Turns Pittsburgh office and prior to joining the firm in 1943, he was a metallurgist-engineer with the U. S. Steel Corp.



Carl B. McLaughlin, with Engineering Service of Tube Turns, Inc.

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Simply brush or spray Brickseal over your refractory lining, and start boiler operation at once. Furnace heat vitrifies Brickseal permanently into all pores, cracks and joints, binding the bricks with a highly-glazed, monolithic coating, impervious to slagging, clinkering, corrosive vapors, flame abrasion and air infiltration.

Sudden temperature changes cannot crack or loosen Brickseal because it remains semi-plastic until boiler cools. Brickseal costs only a fraction of a reline job, and assures long, efficient, trouble-free boiler operation. Write now for sample or Brickseal engineer.



BRICKSEAL REFRACTORY CO.
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CHANGE
of Management
AT
FRANCE
PACKING

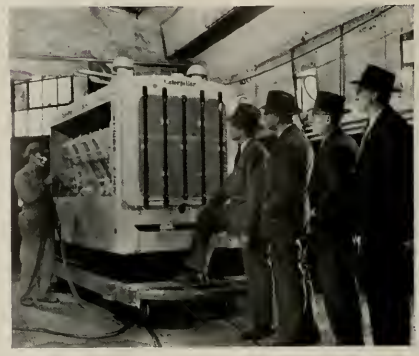
E. A. France, son of Adam Warren France, who patented France Metallic Packing and founded the business nearly fifty years ago, is now president and general manager. J. C. Allen is the new treasurer. Both Mr. France and Mr. Allen have been active in the manufacture of metallic packing for many years.

The new management pledges that it will produce the same high quality metallic packing that has been operated so successfully in engines, pumps and compressors under all conditions of service for nearly half a century. Furthermore, every effort will be made to reorganize the business in order to improve service and delivery.

Remember the Name, FRANCE, Standard of the Industry.

FRANCE
PACKING COMPANY
PHILADELPHIA 35, PA.

In the Caterpillar Paint Spray Booth



On hand to watch fi painters apply "Hig way Yellow" an one Caterpillar's units ar J. R. Munro, genera factory manager (left H. W. Smith, manag of engine sales; D. Bamber, superintende of painting and shi ping, and F. W. He gemeir, superintende of industrial engine a sembly.

It was a joyous occasion recently at Caterpillar Tractor Co. when the first diesel engine in several years emerged from a spray booth in the paint shop wearing a bright coat of famous "Highway Yellow."

For the past few years all Caterpillar products have been painted Uncle Sam's "lusterless olive drab" color, even those few going to critically important jobs on the home front, because of a scarcity in chrome, one of the main ingredients in the "Highway Yellow" developed exclusively for the company.

With a limited quantity of chrome now available, and because civilian users and dealers have always preferred the color, the firm's diesel tractors, motor graders and engines allocated to civilian users are now leaving the factory painted the familiar yellow color.

Port of Embarkation News

On July 24 Major General William M. Goodman was named Deputy Port Commander and Overseas Supply Officer for San Francisco Port of Embarkation. He came to his new post from similar responsibilities at New York Port of Embarkation. For three years as Overseas Supply Officer there, he helped direct the flow of men and materiel that overwhelmed the Germans and brought victory in Europe.

U.S.M.S. CADET HERO "SIGNS ON" WITH GRACE

Fred L. Daelker, vice pres. of Grace Lines in San Francisco, talks over a few post-war plans with Cadet Midshipman William Mitchell of the U. S. Merchant Marine Cadet Corps, who was interned by Japanese in the Philippines. Cadet Mitchell expressed a desire to sail with Grace following his graduation from Cadet School in San Mateo.



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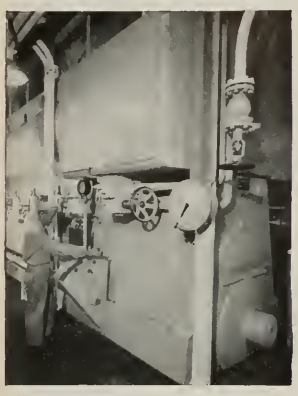
Los Angeles
913 S. Grand Avenue

Nordberg Propelling Engines

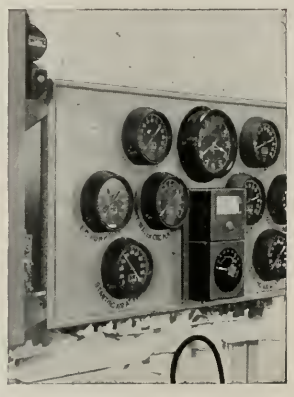


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A 1700 hp. Nordberg propelling engine used in a C1-M-AV1 Cargo Ship.



Alnor Exhaust Pyrometer designed especially for Diesel engine installation.

Many of the Maritime Commission Type C1-M-AV1 Cargo Ships helping to carry supplies all around the world are equipped with Nordberg propelling engines, and Alnor Exhaust Temperature Pyrometers. The constant watch upon exhaust temperatures with Alnor Pyrometers provides a reliable guide to proper adjustment, proper operation and efficient performance of these Diesel engines. Alnor Pyrometers are designed especially for this service, and provide reliable indications that permit efficient operation even under the severest service conditions.

There is an Alnor Pyrometer designed for every operating need, on large or small engines.

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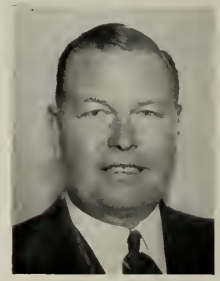
SHORESIDE PERSONALITIES

TRIAL SKIPPER TAKES MATE. Congratulations are being received by Captain and Mrs. J. M. Taylor, following news of their recent wedding in Vancouver, Washington. Captain Taylor, well-known Pacific Coast skipper, has taken all of the tonnage built at the Vancouver yards of Kaiser in Washington on their river and sea trials, in his post as Port Captain.

OWESON REACHES NORWAY. A. B. Oweson, distributor of marine electrical supplies, of San Francisco, San Pedro and New York, was the first civilian from the United States to reach Norway since the end of the war. He arrived there by air transport in order to survey his interests, and visit his branch offices in Oslo and Stockholm.

HARVEY A. MYLANDER IS APPOINTED PACIFIC COAST manager for American Hoist & Derrick Co. This appointment was recently announced by Stanley M. Hunter, vice president of the firm. Mr. Mylander will have charge of the company's offices in the Russ Building in San Francisco.

Previous to taking up his duties with American Hoist, he was associated with General Electric's district office at San Francisco where he worked closely with various governmental agencies, shipbuilding firms and industrial plants.



Harvey A. Mylander, Pacific Coast monager for Americon Hoist & Derrick Co.

WAR SHIPPING ADMINISTRATION announces the designation of Percy Chubb as assistant deputy administrator (Fiscal and Shipping Relations). The F. & S. R. organization will continue the functions of the Fiscal Affairs organization hitherto headed by Mr. Chubb. Its duties will include responsibility for coordination of activities of the various WSA Divisions relating to the Maritime Executive Board.



A. L. Wille, director of purchases, Moore Dry Dock Company, Oakland, was elected president of the Purchasing Agents Association of Northern California at the annual meeting of the association.

U. S. S. IOWA, ONE OF THE NEWEST AND MIGHTIEST OF BATTLESHIPS. HER AIRPLANE CRANE WAS DESIGNED AND BUILT BY

C. H. WHEELER OF PHILADELPHIA



OFFICIAL U. S. NAVY PHOTOGRAPH

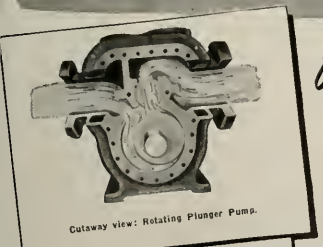
C. H. Wheeler products serving on Navy and merchant vessels include airplane and boat cranes, capstans, anchor windlasses, winches, steering gear, boat and whip hoisting units, surface condensers, and steam jet air ejectors.

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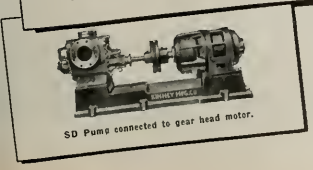
San Francisco Representative: T. S. RYAN, Rialto Bldg. Seattle Representative: BUMSTEAD-WOOLFORD, 1411 Fourth Avenue

KINNEY *Cargo Pumps*





Cutaway view: Rotating Plunger Pump.



SD Pump connected to gear head motor.

for handling vegetable oils etc.

The KINNEY Rotating Plunger Pump easily handles such materials as edible oils, molasses, asphalt, etc. It has no valves, springs or gaskets—and only one stuffing box. Two plungers, set 180° apart, give continuous uninterrupted flow, eliminating foaming. Displacement is positive . . . the pump is accurate as a meter.

Available plain or steam jacketed for either horizontal or vertical installation, driven by gear head motor or by motor through speed reducer. Iron, bronze fitted or bronze constructions as specified. Send for Bulletin 18A.

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Major General Homer M. Groninger, commanding general for the San Francisco Port of Embarkation.

•

NEW YORK SHIPPING CO. OPENS SAN FRANCISCO OFFICE. The Parry Navigation Company of New York recently opened an office at 112 Pine Street, San Francisco, in order to supervise the operation of their vessels, transferred from the Atlantic Coast. The company acts as agent for the War Shipping Administration and their Pacific Coast manager is Charles A. Perkes, well-known shipping man who formerly managed the affairs of C. F. Sharp & Co. on this coast.

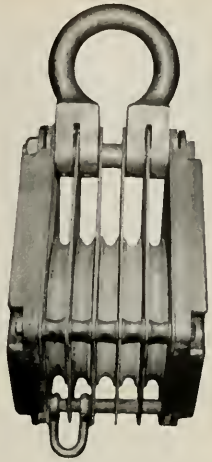




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Elected President of Association

The Purchasing Agents Association of Washington elected Herbert F. Price of Bethlehem Steel Co. to the office of president at its May 10 meeting at Seattle.

Mr. Price has been with the Bethlehem Steel Co. for 27 years, having started at Seattle office on April 25, 1918.

In 1930 he was appointed to the position of Scrap Adjuster at Seattle and in 1935 became assistant to L. E. Knight, district purchasing agent, assuming key functions in purchasing, treasury and traffic departments of the organization.

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Charles Cunningham, assistant manager, Richmond Shipyard No. 4, Kaiser Cargo, Inc.

FIVE JAPANESE FLAGS ARE PAINTED on the midship house of the SS Charlotte Cushman, telling the story of how the Navy gun crew shot down five Nip would-be bombers while the vessel was delivering war supplies at Leyte. This vessel, built by Permanente shipyards, Richmond, California, is commanded by Captain Ellsworth L. Bush of Seattle, and her purser is Harry Hunt, whose home is in Tacoma. The ship escaped without a scratch, according to Captain Bush when reporting the incident to the WSA and the managing agents, Northland Transportation Co., Seattle.

SHIPPING MEN HONOR RETIRING WSA OFFICIAL. Claude E. Wakefield, retiring assistant general counsel of the War Shipping Administration, was the honored guest of the Steamship Claims and Insurance Managers' Association of the Port of New York on July 2. The group of steamship men held the dinner as a testimonial to the distinguished service which Mr. Wakefield has rendered to the Government and the shipping industry.



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Cuts steel
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without distortion

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The Arcturus Drop-Forging, shown above, gives added strength and longer life to Mercury Oil Tool Company's "hard-formation drilling bit" — lower left.

This drop-forging is used on the drilling bit as an arm to hold the rotery cutters, where the density of material and continuous grain flow of metel in the drop-forging enables the bit to "take it" under the most severe drilling conditions. According to the manufacturer, "the added safety factor of Arcturus Drop-Forgings alone, is worth the cost of the forging — not to mention the savings obtained in machine time through the uniformity of the rough drop-forgings."

This is only one of the many ways Arcturus Drop-Forgings give STRENGTH — Where You Need It. Inquiries regarding the use of Arcturus Drop-Forgings in the manufacture of your product are invited — without obligation.



Mercury Hard Formation Drilling Bit

ARCTURUS

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VENICE CALIFORNIA

San Francisco Representative

ALAN P. CLINE, RIALTO BUILDING

(Continuation from page 489)

"Semper Paratus" for These 155 Years

To help in Port Security activities, thousands of patriotic Americans answered the call and enlisted in the Coast Guard Auxiliary and the Temporary Reserve, performing tasks formerly done by regular Coast Guardsmen, releasing these men for combat duty at sea. Ten thousand women have donned the silver shield as members of the Coast Guard Spars.

The Coast Guard is truly living up to its motto: "Semper Paratus—Always Ready."

THE TRAGIC DEATH IN A PLANE CRASH on June 24 of Captain Jake Reznik, agent for Grace Line in Salavery, Peru, where he also held the post of American Consul, was received with sadness by his legion of friends in San Francisco and the rest of the Pacific Coast.

Born and reared in San Francisco, Captain Reznik started his sea career as a cadet with the old Pacific Mail Steamship Company. He served as skipper on many Panama Mail Line and Grace Line vessels out of the Port of San Francisco before being named Peru agent about five years ago.

THE WEBB INSTITUTE OF NAVAL ARCHITECTS recently graduated 12 students into the field, with the degree of Bachelor of Science in Naval Architecture and Marine Engineering. The class included: Paul D. Hubbe, Edward W. Ross, Jr., Richard H. Skidmore, R. D. Jaffin, Robert B. Reed, Thomas P. Callahan, John Louis Wilson, Frank F. Chase, T. H. Bond, John B. Woodward, Jack Griner Gilmore, Robt. W. Wright.

NEW REPRESENTATIVE FOR C. H. WHEELER MFG. CO., Philadelphia, is T. S. Ryan of San Francisco, as the company's California representative. This firm builds steam condensers, steam ejector-type vacuum pumps, water cooling towers, airplane and boat cranes, capstans, winches, special hoists and steering gears.

PACKING EXECUTIVE. France Packing Company, Philadelphia, manufacturer of metallic packing, announces that E. A. France, son of Adam Warren France, who patented the France Metallic Packing and founded the business nearly 50 years ago, is now president and general manager. J. C. Allen is the new treasurer.



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SHORESIDE PERSONALITIES



Commodore Norman B. Hall, USCG, named Chief of the Merchant Marine Inspection Division, succeeding Commodore Halert C. Shepheard (at right), USCGR, who is taking the post of special assistant to Admiral Waesche, Coast Guard Commandant.

TWO COMMODORES GET NEW C. G. ASSIGNMENTS. Commodore Norman B. Hall, USCG, has been appointed chief of the Merchant Marine Inspection Division of the Coast Guard, succeeding Commodor Halert C. Shepheard, USCGR, who has been appointed a special assistant to Admiral Russell R. Waesche, the commandant. Announcement of the change was made at Coast Guard Headquarters, Washington, D. C.

Both officers are members of the Coast Guard's Merchant Marine Council.

Commodore Hall who sat as vice chairman of the Council, developed the C.G.'s wartime post security program and prior to the war was Inspector-in-Chief of the Service.

Commodore Shepheard, a native of Boston, is a former assistant director of the Bureau of Marine Inspection and Navigation. When that Bureau was transferred to the C.G. in 1942, he was commissioned a Captain in the Reserve.

AT THE CUTLER-HAMMER, INC., annual meeting of the board of directors held June 15, the management organization was broadened by the election of the following officers: F. R. Bacon and G. S. Crane, members of the executive committee; F. R. Bacon, founder of the company, is chairman of the board; H. F. Vogt, chairman of firm's executive committee, is vice president and treasurer; G. S. Crane, formerly vice president in charge of sales and engineering, is new president; M. R. Fenno, assistant treasurer; and J. C. Springer, manager of credit and collection department, is assistant secretary.

MARINE TRANSPORT LINES, INC., OPENS SAN FRANCISCO OFFICE. Due to the transfer of many of its vessels from the Atlantic waters to the Pacific, the Marine Transport Lines, Inc., of 11 Broadway, New York City, is now handling its affairs on the coast at 510 Battery Street, San Francisco. H. S. Woodman is the manager.

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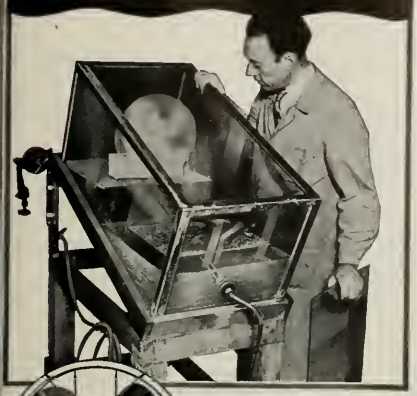


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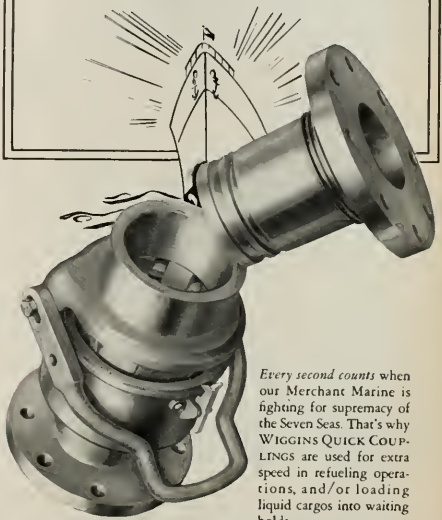
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Hot off the Press

"Oil and Gas Burners," a new bulletin, No. 902, has been published by the Peabody Engineering Corporation. It describes and illustrates the mechanical and operating features of these burners, for natural or forced draft operation, and also shows the types of atomizers used for oil firing.

Formed Steel Tube Institute have available a new catalog, "Better Products With Electric Welded Tubing." This book was written for product designers and is profusely illustrated with both wartime and peacetime uses. It contains specifications of various tubing applications and offers a very complete handbook.

The Cleveland Worm and Gear Company has published a four page illustrated bulletin entitled "Speedaire," which is a concise description of fan-cooled worm gear reduction units. It shows just how the high velocity air stream is held on a directed course by the double wall housing, and how the heat-dissipating surface is nearly doubled by integrally cast fins on the outer wall of the housing.

The B. F. Goodrich Company has issued a general booklet on its industrial rubber products. The book contains discussion of vibro-insulators, molded extruded, lathe cut and sponge rubber products, rubber lined tanks and valves, Koroseal, V-belts and cements.

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Lieutenant Commander David B. McMichael, USMS, executive officer, U. S. Maritime Service Officers' School, Alameda, California.

New Executive at Alameda

Lieutenant Commander David McMichael, USMS, recently appointed executive officer of the USMS Officers' School at Alameda, began his seagoing career in 1932 as a cadet on the California Nautical Schoolship. Since his graduation in 1935, he sailed off the West Coast as a licensed officer until the outbreak of war, when he was assigned to the training vessel, American Sailor, as officer and instructor. He spent some time at the USMS school at Avalon, later being transferred back to the American Sailor as executive officer, operating in the waters of the Gulf of Mexico.

California to King's Point

Lieutenant Thomas R. Rooney, USMS, regional public relations officer for the WSA Training Organization in San Francisco, has been appointed public relations officer for the Annapolis of the Merchant Marine, the United States Merchant Marine Academy at Kings Point, Long Island, N. Y., WSA announced recently.

Lieutenant Rooney has served in San Francisco for one year directing public relations for the U. S. Maritime Service, the U. S. Merchant Marine Cadet Corps, and the California Maritime Academy.

Previously Lieutenant Rooney was public relations officer for the U. S. Maritime Service in Kansas City. Prior to joining the service he was director of sales promotion for the Columbia Broadcasting System in St. Louis.



Lieutenant Thomas R. Rooney, U.S.M.S., en route to Kings Point Academy.

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MANUFACTURERS OF ALL TYPES OF BEARINGS

Pacific MARINE REVIEW

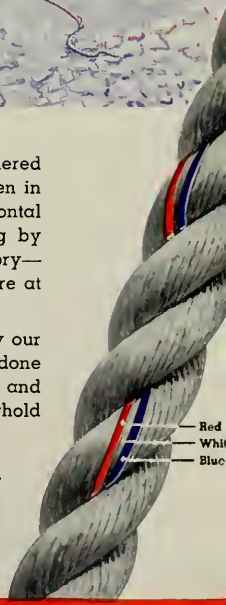


THE JAP WAS A ROPE'S LENGTH AWAY!

PRECIPITOUS cliffs, rising sheer from the sea! Atop them the cornered Jap fought desperately, pouring his deadly fire on our troops. Hidden in the caves which honeycombed the terrain, he made a last stand. A frontal attack with dynamite, sealing forever the enemy-infested caves, taking by surprise the entrenched Sons of Heaven above, would speed the Victory—save lives. Rope . . . strong, pure Manila Rope . . . the kind we make here at Columbian, was needed.

Because we at Columbian have never relented in our drive to supply our fighters with all the Rope they need . . . because you have cheerfully done *without* much of the Rope you need . . . because you have taught and practiced conservation of Rope—that Rope was ready! The last Jap stronghold in Manila Bay fell! Again Rope helped turn the tide of Victory!

Until that Victory, Columbian Pure Manila Rope—with the Red, White and Blue markers—will continue to go first to the armed services.





COLUMBIAN ROPE COMPANY
400-90 Genesee St., Auburn, "The Cordage City," N. Y.

COLUMBIAN ROPE *is a Sinew of War*



ight: Color value test—one of the many ests made to insure perfect uniform- y during every phase of production.

They take BOTH "Know How"



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To produce fine rope — rope that will always be dependable under toughest conditions — also requires "know how."

For instance, rope demands constant testing during every phase of production to assure uniform quality. One of the first of these tests is the scientific color value test (above). Minutely cut fiber is washed, dried and observed through prisms for color comparison with accepted standards.

It is nearly a century of this kind of "know how" in rope making that has made the name Tubbs stand for uniform dependability.

TUBBS EXTRA SUPERIOR MANILA CORDAGE COMPANY

Remember this trademark in postwar days — remember NOW to specify TUBBS when rope must be replaced.

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J. S. HINES
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MEMBER AUDIT BUREAU OF CIRCULATIONS

Subscription rates:
...e year, $1.50; two years, ...i0; three years, $3.00; for-..., $1.00 additional per year; ...le copies, 25c.

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PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
Offices in: NEW YORK CITY . . . . . 16 West 46th Street, Telephone BRyant 9-8436
LOS ANGELES . . . . . 816 West 5th Street, 13. Telephone MIchigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.

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Post-war Planning

Pacific MARINE REVIEW

In early July PACIFIC MARINE REVIEW mailed to the leading American ship operators and shipbuilders a short questionnaire, asking for information as to their planning for the future. A large proportion of the firms have answered, and this article is a consolidated summary of those replies.

The shipbuilders answering had at their peak business an aggregate employment of 354,000. Those intending to continue as ship repairers and shipbuilders estimate their post-war normal employment of 79,000.

Every old-established shipyard intends to maintain shipbuilding and ship repair facilities. Those shipbuilders who are operating agents for U.S.M.C. in Maritime Commission-owned yards have no basis for future planning until U.S.M.C. adopts a firm policy as to the future of these properties.

Nearly all yards will complete all work on Maritime Commission contracts for new vessels before the end of 1945. A few yards will run on these contracts well into 1946. Practically all of the Maritime Commission yards are being converted to repair activities as fast as the new construction work is out of the way.

A few yards working on Navy contracts have on the ways vessels that are scheduled for completion in 1947.

A number of the older yards will revert to general engineering work and fabrication of structural steel along the same lines that characterized these firms pre-war. Some of the operating agents for U.S.M.C.-owned yards have plans for non-marine activities which could very beneficially be put in operation if the plants can be purchased or leased under favorable terms.

The viewpoint of the shipbuilders as judged from the answers to this questionnaire indicates a very busy time on repairs, reconversions and new construction in the immediate future, with a very uncertain longer vista. This uncertainty can be eliminated by progressive legislation on ship disposal policies and shipbuilding subsidies or parity payments. The Harvard report offers some very constructive suggestions on these points.

Turning to the answers of the ship operating firms, we find a very similar strain of long-range uncertainty.

A minority have their plans all nicely laid out to operate their pre-war routes with larger and better ships. The majority of this minority have already purchased or committed themselves to purchase from the Maritime Commission the ships necessary for this purpose. The vessels so committed are practically all C-2's or C-3's, the totals of those indicated being 62 C-2's, 54 C-3's, 11 tankers and 4 P-2's, an aggregate of approximately 1,500,000 total deadweight capacity.

An interesting trend, and one that indicates economical operation, is that all of the firms concerned are choosing larger and faster vessels than they operated pre-war. From our contact with other firms who will not yet make definite commitments we know that their plans trend along the same lines. Other factors being equal, the largest vessel that can be kept running reasonably full is the most economical ship. This factor of size combined with speed becomes more important as wages go up. The American merchant fleet for many years has led the world in average size of vessel.

Our conclusions from an analysis of the answers to our questionnaire are:

(1) That the established shipbuilders and shipping operators of America are doing some very shrewd planning for future operations.

(2) That the results of this planning can be accomplished only when Congress passes wise, progressive ship disposal legislation.

(3) That the American Merchant Marine should be set free from restrictive rules of various governing bodies such as the ruling prohibiting steamships lines from entering the air transport business.



PRINCESS PAT

Delivered by Consolidated Steel Corporation



Otto Kiessig, managing owner of the Princess Pat, with his daughter, for whom the vessel is named, and his son Russell.

THE NEW TUNA CLIPPER Princess Pat, which was built by Consolidated Steel Corporation's Boat Division at Newport Beach, was delivered on July 18 to her owners, Otto Kiessig and Associates of San Diego. She is not the largest tuna clipper afloat, but she will carry more tons of fish per foot of length than any other boat of her type, and will return to Sun Harbor Packing Co., San Diego, fully loaded, with ample freeboard and stern well out of the water.

The Princess Pat has these advantages over other clippers because Consolidated Steel Corporation decided, when its tuna boat construction program was begun, that the vessels would be fire-proof steel hulls, 20 per cent lighter than similar size wooden vessels, and that they would

have lines sufficiently full aft to carry the fish and bait water loads with ample freeboard and safety.

It was also planned that, while these first four 99 ft. clippers would not be classed with American Bureau of Shipping, they should meet all the Bureau's requirements and also those of the U. S. Bureau of Marine Inspection for fishing vessels under 100 ft. in length.

The Princess Pat is a long cruising range, single screw, welded steel, raised deck type tuna clipper with raked stem, and presents a smart appearance with her semi-cruiser stern, and streamlined pilot house.

Trials and Data

The sea trial was run on July 18, 1945, and an average speed of 11.1 knots was attained over the measured mile, which was considered highly satisfactory for a tuna clipper of the Pat's dimensions and carrying capacity. Exhaust temperature at full power was 709°, and all other temperatures and pressures were normal for the trial conditions, which will allow ample safety margin for operation in high temperature tropic waters.

Upon delivery, the ship proceeded the same day to San Diego, making the run of 65 knots in 5 hours and 45 minutes.

The preliminary design of the vessel was by the owner and his architect O. Tellefsen. The final design and working drawings were made by Consolidated Steel Corporation, Small Boats Division, Maywood and Newport, California.

General Characteristics

Length, over-all, 99 ft.
Length, B. P., 90 ft.
Beam, 25 ft.
Depth amidships, 13 ft. 9 ins.
Draft, light forward, 8 ft. 9 ins.
Draft, light aft, 6 ft. 10 ins.
Draft, loaded with 175 short tons fish, oil and F. W. for return trip, 11 ft. 6 ins. (even keel)
Displacement, light, 238 tons, long
Displacement, loaded, 430 tons, long
Propulsion power, 600 shp 400 rpm
Propeller, 69" dia.—45½" pitch, 3 blades
Block coefficient, .58
Speed on trial (loaded), 11.1 knots
Fuel tank capacity, 28,500 gals.
Fresh water, 2400 gals.
Cruising radius, 9000 nautical miles
Complement, officers & men, 12
Net fish capacity inside of ammonia coils, 7400 cu. ft.
Gross fish capacity to inner skin of compartments, 8350 cu. ft.

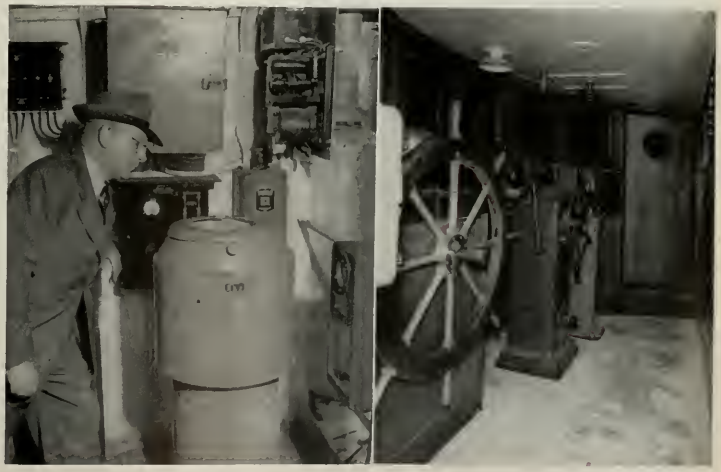


Catholic shrine in crew's quarters.

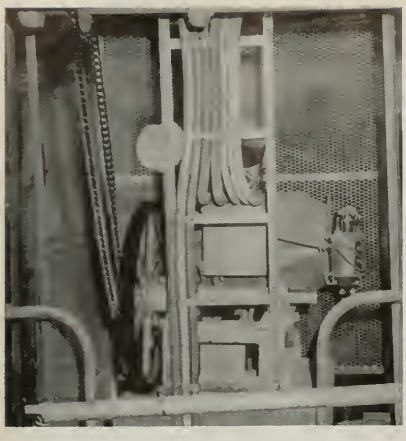
Hull Construction

The hull, main deck bulkheads, raised deck sides and bait tank are of welded steel construction, and the deck houses are of wood with plywood sheathing inside and out.

The stern frame is of forged steel in four sections electric welded together, forgings and weldings by Consolidated Steel's Maywood Shops. Castings for usual type of deck and



Left: W. I. Selover, Los Angeles district manager, Sperry Gyroscope Company, observing operation of Sperry Mark 18 gyro compass. Right: Sperry equipment in pilot house. Hand steering wheel, Sperry gyro repeater and automatic helmsmon, and engine room telegraph in pilot house.



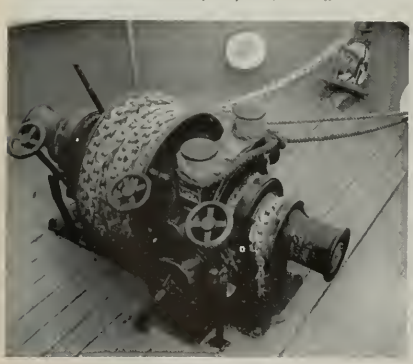
Sperry Electra Mechanical steering unit driving Johnson gear shaft through sprocket chain.

hull fittings have been replaced by built-up structural weldments Consolidated-designed and fabricated.

Diesel oil is carried in the lower forepeak, the double bottom, and the wing tanks just aft of the fish holds. Diesel oil may be carried in the forward fish well hold when required for long voyages.

The arrangement of fish holds, bait tank, galley, upper engine room, and crew's quarters in the raised deckhouse, is similar to conventional tuna clipper design. However, a new feature of the design is the addition of salt water ballast wing tanks with a total capacity of 18 tons at the after end. When the ship's fish holds are fully loaded with fish, the heavy salt water load is decreased and perhaps 2/3 of fuel oil is consumed. Then, due to her excess of buoyancy aft, the stern begins to rise. These ballast tanks will then be filled with sufficient water to hold the stern down to the water surface.

To those unfamiliar with tuna fishing it should perhaps at this point be explained that it has been found by experience that when fishing is good, and the fish are large, the top of the bulwark rail aft should not be more than 34" above the water surface, otherwise, the labor of whipping 60 lb. tuna over the shoulder onto the deck is excessive. During heavy fish runs the fishermen standing on the fish racks outside the stern, catch and heave fish inboard for many hours without rest. When the fish cargo is complete the ballast tanks can be pumped dry, and the stern will rise to about 3' 3" above the water, giving a safe amount of freeboard, and a clear run to the wake, for a speedy trip home.



Anchor windlass.

Fish Hold Insulation

Fish holds are constructed by fitting inner tanks of 1/4" steel plate partially fabricated with transverse bulkheads, and partially fitted after erection of ship's side plating and bulkheads. The inner tank plating does not touch the outer steel side frames, bulkhead stiffeners, inner bottom plating, or deck beams, but is kept 1/2" clear by Douglas Fir framing strips of size to suit outer framing; furring is pretreated with Cuprinol paint. The space between the inner and outer plating is filled with Johns-Manville BX-4 Fireproof Insulation.

The holds are tested for tightness by air pressure applied between inner and outer skins, interiors being shored during testing.

Propulsion Machinery

The main propelling engine is a six cylinder direct reversible 4 cycle Elliott Buchi supercharged Enterprise DMG 36 developing 600 bhp at 400 rpm, 22 MM on fuel rack, with 733° F. exhaust heat. This engine is directly connected to propeller shaft by a 4 3/4" dia. steel line shaft, with sleeve couplings running in Minder spring bearings. Propeller shaft is of steel, 5 1/2" dia., rubber covered between liners and running in a Goodrich Cutless bearing at the aft end of a steel pipe stern tube. In order to prevent possible interruption of service forced water lubrication for stern tube bearing is provided from three sources, main engine circulating salt water, bait system and condenser system. Propeller is a 3 blade, erosion resistant one piece bronze wheel, designed by William Lambie and manufactured by Doran Co., Seattle, Washington.

The main engine has a closed fresh water cooling system, sea water circulation being provided by an attached engine pump drawing from the main sea chests, through a Macomb type strainer; but as the clipper will be run at low speeds when fishing the fire line is connected to the system to insure sufficient cooling water when in the tropics, where sea water runs as high as 92° F. The heat exchanger is by Harrison with special Navy specification corrosion resisting tubes.

Exhaust gases from main engine are carried to atmosphere through a

Kittell spark arrester and from auxiliary engine through Kittell spark arrester silencers. Eclipse flexible pipe is used between engines and silencers. As the main engine exhaust gas passes through the supercharger turbine a silencer is not required.

Exhaust piping between engines and silencers is insulated by Johns-Manville 1½" "Superex" and ⅛" fire felt, over high-rib lath.

Auxiliary power is provided by two 75-kw, 240-v AC Caterpillar diesel electric generators, closed F.W. system, sea water cooler, gasoline engine starting, located one port and one starboard in the lower engine room. These generators are completely self-contained units with the advantage that starting one unit almost immediately provides power and light. Starting air at 250 psi for main engine is supplied by an Ingersoll-Rand electric motor driven compressor for starting, and for maneuvering by a compressor belt driven off main engine.

The system is operated by engine driven pumps circulating the oil from dry engine sump through Luber Finer filter to day tank and return to engine through a Ross cooler.

A pre-lube Deming hand pump, 10 gpm, is installed to be operated before engine is started in order to insure pressure on all lubricating supply lines.

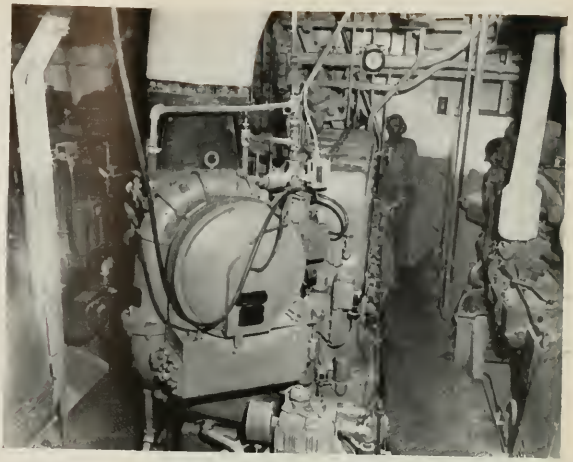
Storage for 720 gallons of lubricating oil is provided in tanks separated from vessel's hull. Lubricating oil transfer pump is a 1½-hp Fairbanks-Morse, Type 7.

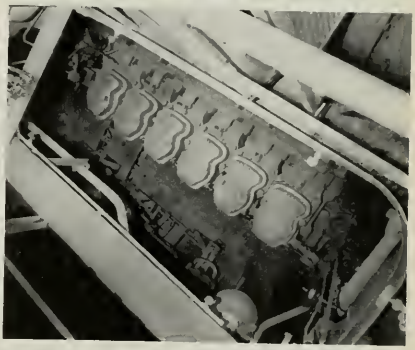
Oil is drawn from storage tanks through Purolator strainers and delivered to a 116-gallon day tank by engine driven fuel pump; and gravity supplied to engine through duplex strainers to the pre-pressure pump, then through a Winslow filter to high pressure pump and headers. Fuel oil transfer pump is a F.M. rotary 1½-hp 90 gpm.

Lower engine room is supplied with fresh air by a 2500-cpm ¾-hp Western Blower Co. fan, with ducts leading to forward end under floor plating and to each generator.

Piping and Pumps

The fish holds and bait wells are all connected to a brine supply and discharge system, by which any cargo compartment may be filled with clean sea water for chilling and freezing. Each compartment also has an independent brine circulation sys-





Above: Engine room, featuring Enterprise supercharged propulsion diesel with Caterpillar auxiliary generating sets port and starboard.

Right: Looking down through engine casing at top of main engine.



Main switchboard in engine room.



Control board for refrigerating machinery and C-O-Two fire extinguisher bottles. Ben Duggan of Baker Ice Machine Co. standing by.

tem which draws brine from the lower part of the hold and discharges at the top to provide a constant circulation of cold brine when the fish are being loaded and frozen.

There is one main brine transfer pump 5-hp centrifugal 300-gpm, in the pump room recess, and ten 2-hp centrifugal 220-gpm brine circulating pumps, all of Fairbanks-Morse manufacture.

The bait water system is operated by two 15-hp 2800-gpm Fairbanks pumps, either of which can operate the system, which supplies a constant change of bait water to the Nos. 2 and 3 fish holds, and the bait tank on deck. This system also is arranged to supply circulating water to the ammonia condenser and stern tube bearings.

Bait water overflow valves are located on the main deck at Nos. 2 and 3 holds, and in the bait tanks to permit constant discharge of water when carrying bait.

Discharges into holds and tanks are diffused for full length of compartments by portable wooden screen boards with 5/32" sawn slots. Overflows are also screened in a similar manner to prevent loss of bait.

The fire pump is centrifugal 7½-hp 200-gpm supplying deck fire line, and providing emergency service for main engine and condenser.

The bilge pump, which can be used in emergency for brine circulation, is a centrifugal 5-hp 300-gpm. Automatic units, consisting of pump and pressure tanks are provided to supply F.W. and S.W. to toilets, lavatories, showers and galley. All pumps, motors and units are Fairbanks-Morse.

Refrigeration

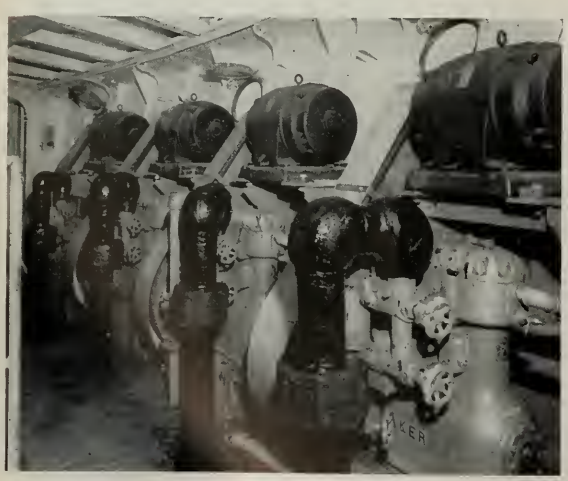
A complete brine refrigeration system, compressors, piping and fittings was supplied by the Baker Ice Machine Co. and installed by the builders.

Equipment comprises four ammonia compressors 4 cylinder 3½" x 3½" belt driven by 15-hp Fairbanks-Morse motors located in the upper engine room; one condenser, 2300 lin. ft., is located in the condenser tank on the main deck aft; and two ammonia receivers in the aft end of shaft alley.

Water for the condenser and compressor cooling is provided by a 5-hp, 300-gpm, Fairbanks-Morse pump.

Eight fish holds and two bait tanks are piped with 7000 ft. of ammonia coils. A separate 2 cylinder 2⅞" x 2¼" compressor and system is installed for galley refrigerator, meat room and cool room.

Baker refrigeration compressors belt driven by Fairbanks-Morse motors.



Steering Gear

The balanced rudder has an area of 29 sq. ft., 2.5 per cent of the vertical plane area, and is fitted with a 4" Johnson worm and gear segment steering gear, with self-contained Timken roller bearing rudder carrier. Provision is also made on top of gear for emergency tiller steering. The gear is operated by a shaft carried forward through the shaft alley, and up to the pilot house by means of a link belt, sprockets and chains, to

48" wooden steering wheel stand, for emergency steering in case of power failure.

A new Sperry electro-mechanical Type S steering engine is installed in the upper engine room and drives the Johnson gear shaft through a sprocket chain system. A complete Sperry automatic steering system, including Sperry Mark 18, gyro-compass, 5-hp, DC motor generator, combined automatic and hand steering stand, and compass repeater is installed in the pilot house. Installation was made under the personal supervision of W. I. Selover, Los Angeles district manager of the Sperry Gyroscope Company. This automatic steering on the sea trial was an amazing performance, when compared with hand steering, and when it is considered that a short deep draft vessel in a beam sea is difficult to steer, the straight line wake was very impressive.

Deck Machinery

Two Columbia Steel Co. 400 lb. anchors, and 40 fathoms of ¾" galvanized anchor chain each, were supplied by The Marine Company of Philadelphia. A deep sea 200 lbs. Danforth anchor with 1200 feet of ⅝" 6-19 Flex plow steel wire is handled with ease by a Johnson special No. 3 windlass chain driven by a 10-hp Fairbanks-Morse motor fitted below the deck.

Two 5-hp cargo winches complete with automatic mechanical brake and driven by 5-hp geared U. S. motors were specially designed and built by Consolidated Steel.

One winch handles the cargo fall, and the other the topping lift, and both may be operated by remote cable control from either port or starboard sides.

Equipment

Galley range is electric Marine "Hot Point" Edison, 60 cycle 220 volt AC supplied by Dohrmann Supply Co. Galley is fitted with stainless steel double sink, and tiled drain board.

Hinged storm shutters are provided to cover the main deck passageway side openings, arranged to fold out of the way in good weather.

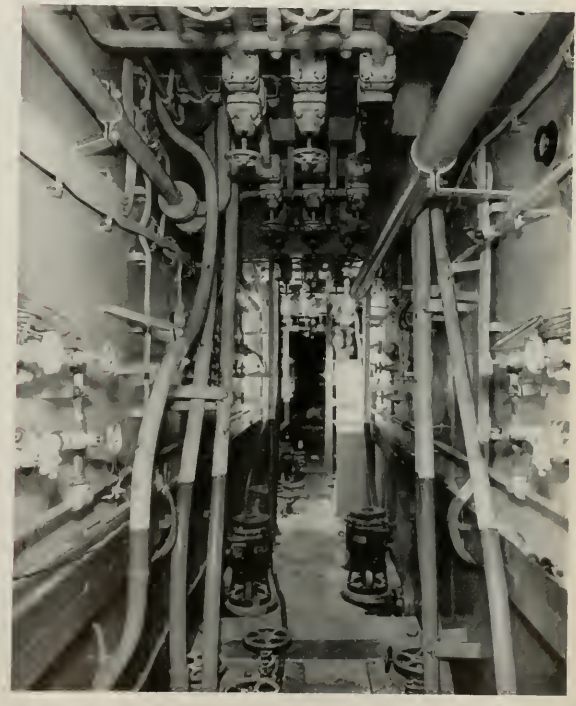
The streamlined mahogany paneled pilot house is equipped with a Fathometer from the Submarine Signal

(Page 554, please)



Refrigeration piping in fish hold.

Piping, valves and pumps in passage.





Old Problems Of Shipyard Management

By James R. Moore

Retrospect and Prospect

It is refreshing now and then to encounter a business executive who makes a study of his business, its history, present condition, and future prospects. James R. Moore does just that. Brought up in a shipyard, he has studied the history of the shipbuilding art in all of its phases. The present article is part of the introduction to an address on "Shipbuilding During World War II."

It so impressed our staff artist, Miss B. Boynton, that she did some research on costuming and ship hull forms in Venice for the period covered, and produced the original water colors from which our illustrations are made.

Human nature in the mass has remained unchanged through many centuries and will continue to affect industrial management through many more. This is one factor in the progress of mankind that even the atomic bomb cannot touch.

I SHOULD LIKE to take you for a few minutes to the Venice of the 15th and 16th centuries during a time when the Venetian Arsenal, the equivalent of our modern Navy yard, was building ships for use against the traditional enemies of Venice, the Turks, the Cyprians and Genoese. Even then, great pressure was being exerted upon the shipbuilding industry for vast fleets of many different types of ships. In the light of contemporary conditions it is a fascinating experience to read of some of the tribulations of these ancient shipbuilders, for problem for problem, annoyance for annoyance and, in many cases, solution for solution, a counterpart of these problems of centuries ago can be found in modern shipyard experience.

We read of the problem of maintaining discipline in ancient Venice as follows:

"A strike (by the shipyard workers) would have been a dangerous thing if they had had any real spirit of revolt. Even a passing outburst over a particular grievance had to be managed in politic fashion. Such an outburst occurred in 1569 as the result of a decision that they should not be paid for Saturday afternoons since all that afternoon was spent in paying them. The next Saturday, when the bell of the Arsenal sounded at noon for them to go out, and they understood they were not to be paid for that afternoon, there was a great uproar. Some three hundred seized axes and mallets and surged across to the Piazza. They went to the Chiefs of the Council of Ten and demanded in abusive and threatening language that the full day's pay be restored to them. A Chief of the Ten told them they seemed to wish that he hang six or eight of them by the neck. They

The author is vice president, Moore Dry Dock Company.

replied that they would go where they would be listened to, and burst in upon the College. There the Doge quieted them and sent them away with fair words. When the mob had scattered, the Ten arrested a few of the leaders but let them out again in six months. The next Saturday the Lords and Commissioners called the masters to the office one by one, and by cajoling some and threatening others restored discipline. . . . It was considered a regular part of the pay of the masters (in the shipyard) that they should be supplied with wine while they worked, and wine was passed around the Arsenal five or six times a day. Hence the need of a wine steward who would be as sparing as possible in its distribution, and who would buy only good wine lest, as happened in 1528, it spoil and incapacitate the masters. The attraction of these free drinks drew many to the Arsenal and the consequent heavy consumption of wine was one reason why the doors had to be closely watched."

The problem of keeping the men efficiently employed was no small one because of enforced idleness and sleeping. A preamble to a new regulation was:

". . . The masters of our Arsenal (i e., shipyard) work in great confusion. When they have entered the Arsenal part go wandering around without doing any work, and part work in whatever dock pleases them so that the chiefs do not have certain workers assigned them, nor do the workers know who are their chiefs. And that is because most of the masters are not assigned to chiefs, and if the construction chiefs are blamed for having done little work, they say they had few workers. . . . A certain Piero was boss over a group of caulkers but they did not attend to their work and one of them, Sebastiano, went off to sleep. Piero reported to the paymaster of the caulkers, and when Sebastiano came back to work that afternoon the paymaster told him to go away for he had been taken off the pay roll."

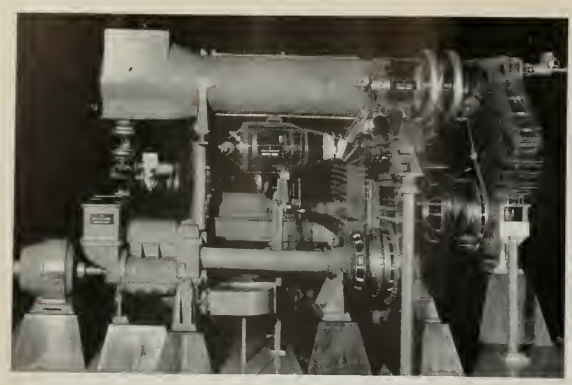
Jurisdictional disputes, the bugbear of many a modern shipbuilder, were known in those days. If in the following passage we mentally substitute marine machinists and pipefitters for carpenters and caulkers and valve removing for caulking, we find shipyard history repeating itself almost verbatim.

The carpenters "had been engaged in a controversy with the caulkers which arose from the very nature of their occupation. . . . They naturally desired to include the caulking of these boats within their craft. When the caulkers obtained from the Board of Manufacturers a decision forbidding the carpenters to do or have done any caulking, or to sell or promise to make, any boats otherwise than uncaulked, the carpenters protested and carried the case to the College which decided in their favor. The carpenters were permitted to caulk any vessel of 94 tons or less in their own shipyards: but were required to pay yearly dues to the caulkers' guild. . . . They had won on the essential point, for they had gained a legal basis for one of those long drawn out quarrels over the division of labor between crafts which appear typical alike of the medieval guilds and the modern trade unions. The caulking of small craft became a battle ground over which each guild fought in an effort to win for its membership as much work as possible. The carpenters reached a mutual understanding that if they needed assistance they would hire each other. The caulkers protested successfully. Then the carpenters tried a new dodge, promptly discovered and denounced by the caulkers, by registering themselves as apprentices to other heads of shipyards. After renewed appeals to the highest authorities had produced a decision that such work must be equally divided between the two crafts the gastaldo of the caulkers had to be ever on the watch to see that the carpenters did not get more than their share of the work. Continual bickering over such matters gave expression to a primary purpose of the guild, the defense of the economic self-interest of a particular group of craftsmen."

And so, you see, there is really nothing new under the sun, including sleeping on the job, jurisdictional disputes and the thousand and one other problems that 20th century shipbuilders face.



Marine Passes



Model of Elliott marine gas turbine.

AMERICAN MARINE ENGINEERING history took a long step in advance when the first gas turbine for ship propulsion recently passed its official tests at the plant of the Elliott Co., Jeannette, Pa.

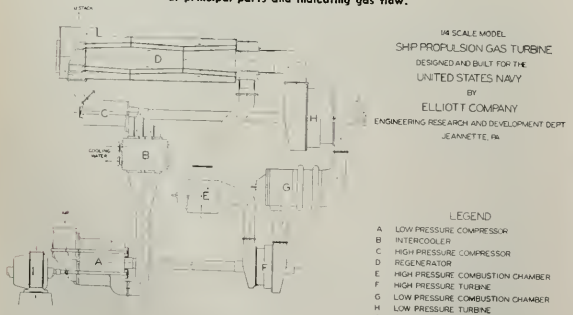
Discussed for many years as the ship propulsion power of the future, the practical development of the gas turbine was limited by the ability of metallurgists to provide metals that would stand up against high temperatures and high pressures; and the ability of designers to provide air compressors of high efficiency. Shortly prior to this war both of these limitations were beginning to be eliminated, and that process has been greatly expedited during the war by exhaustive research. It is predicted that in less than a year we will see a 10,000-ton special type Liberty collier powered with a gas turbine.

The first commercial use of the gas turbine was in installations where power was produced as a by-product of an industrial process, which itself produced waste gases of high temperature and considerable pressure. In America a number of installations were made to use the waste gases from the Houdry process plants in oil refineries. In these installations much was learned about the practical availability of high-temperature alloys for blading of gas turbines.

Marine Gas Turbines

Some time back the following American firms began manufacturing studies of gas turbines as marine prime movers: Allis-Chalmers Manufacturing Co., Milwaukee, Wis.; DeLaval Steam Turbine, Trenton, N. J.; Elliott Co., Jeannette, Pa.; General Electric Co., Schenectady, N. Y.; Joshua Hendy Iron Works, Sunnyvale, Calif.; Westinghouse Electric Corp., So. Philadelphia, Pa.

Diagram of Elliott marine gas turbine, showing arrangement of principal parts and indicating gas flow.



Both the Bureau of Ships of the Navy Department and the Maritime Commission have taken a deep interest in these studies, and have helped greatly by making it possible for these manufacturers to continue in this work at a time when the demand for ships' machinery was the greatest in history.

At least three of these firms have already built experimental marine gas turbines for the Navy and the Maritime Commission. These three are Elliott, DeLaval, and Allis-Chalmers.

Allis-Chalmers built a 2000-hp unit six months ago, and this unit is now undergoing tests at Annapolis by the Bureau of Ships.

The DeLaval Steam Turbine Company are building two gas turbines for the Navy, one of 750 hp and the other of 4000 hp. The latter is the highest powered unit so far ordered in the United States.

The Elliott Company have three gas turbines under construction: one of 3000 hp, to be installed in the specially designed Liberty collier building at the Federal Shipbuilding and Dry Dock Co., Kearny, N. J.; one of 3000 hp for the Navy for an electric drive vessel; the third unit was the subject of the successful demonstrations and tests at Jeannette, which are discussed in this article. So far no method has been devised for reversing a gas turbine. In the collier above mentioned reversing will be obtained through a variable pitch propeller. In the Navy electric

Photographs courtesy Elliott Company.

Gas Turbine
U.S. Navy Tests

By T. Orchard Lisle

Eastern Editor, Pacific Marine Review

drive, reversing will of course be accomplished electrically through the propulsion motor.

Thermal Efficiency

While all of this work is intensely interesting and of great importance in the advance of the gas turbine, the manufacturers are not yet ready to assure the ship-owner that he can have high powered gas turbines in his first post-war ships.

Existing forms of marine power show 30 to 35 per cent thermal efficiency. To compete with this economy the gas turbine must eventually have a performance equivalent to a thermal efficiency of 33 per cent or better. This means very high operating temperatures—say over 1500° F., which in turn involves a heat exchanger of large surface to recover some of the heat exhausted by the turbine. It also necessitates the use of even better alloy steels. Around 1400° is the maximum operating temperature of marine type turbines now under construction and test. The prospect of gas turbines of 7500 hp or higher is still some considerable time away, but the power of merchant ships is steadily climbing.

Tests at Jeannette

On July 23, 24 and 25, a series of preview demonstration runs were made by the Elliott Company at its Jeannette, Pa., plant for the benefit of the technical press and others interested. The gas turbine being put through its paces was the 2500-hp unit for the Navy. It has a thermal efficiency of about 29 per cent, which compares with 26 per cent for a steam plant of similar capacity and 33 per cent for a diesel plant.

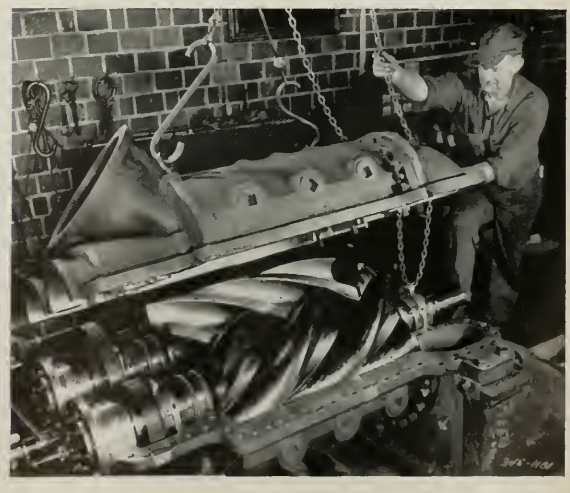
Since this plant has been designed as a marine propulsion unit for the U. S. Navy, the demonstration included actual manipulation of the gas turbine in accordance with marine requirements. So that witnesses could see exactly what was going on, a large replica of a typical ship's engine-room telegraph was placed in a position high enough to be seen. This instrument consists of a lever which is thrown to various positions to signal the engine room such directions as "full speed ahead," "stop," "full back."

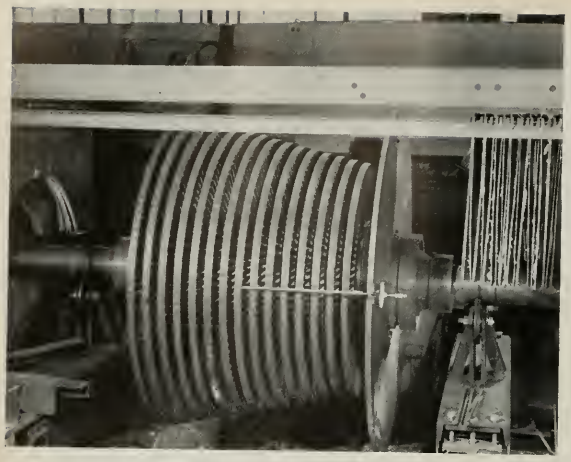
Maneuvers included in the program were: (1) plant idling at 1500 rpm, firing with one burner and no power output; (2) light the low-pressure burner involving several steps quickly accomplished; (3) throttles advanced and speed increased to 2750 rpm (full power); (4) decrease the speed to 2250 rpm, i.e., full power to two-thirds; (5) one combustion chamber cut out, demonstrating fuel economy at reduced power output; (6) crash "stop" from two-thirds speed, ending with the turbines on turning gear; (7) the starting motor brought the speed up to 1000 rpm, at which point the high-pressure combustion chamber was "lit off," the starting motor cut out and the plant became self-operating; (8) the low-pressure combustion chamber was lit off, the turbine brought from "stop" to "stand" speed, 2500 rpm; (9) from "stand" speed the plant was reversed to "full astern" by cutting the throttles to minimum flame, putting the plant on idling, reversing the propulsion motors, then increasing turbine speed to 2750 rpm; (10) another crash stop made by closing the throttles, stopping the injection pumps and putting the turbine on turning gear.

Compressors

In viewing the foregoing maneuvers it may be well to remember that during the performance huge quantities of red-hot gas were handled through the high-speed compressors and turbines to produce 2500 hp of

Vital to the successful operation of Elliott Company's new gas turbine is the 12,500-cfm Elliott-Lysholm compressor, shown with upper casing removed.





Rotor of low-pressure turbine.

useful energy. In this way the great engineering and metallurgical advance that has been made can better be appreciated.

The compressor adopted by Elliott for their gas turbine is of new form developed in collaboration with Alf Lysholm of the Ljungstroms Angturbin, Sweden. It delivers clean, oil-free air, and operates independently of change in flow or pressure.

Efficiency

The space occupied by this gas turbine plant is approximately 3½ cu. ft. per hp, and the weight will run 20 to 30 pounds per shp. Medium grade fuel oil is used, but studies are now being made to ascertain if lower grades of oil, powdered coal or oil from coal, can be used in commercial practice. The use of reasonably good grades of fuel oil has not retarded progress of the diesel engine to any extent; nor should it hold back further development of the gas turbine by reason of the fact that out of every long ton of diesel oil a ship-owner gets 7.4 bbl., whereas for each ton of Bunker-C fuel oil he receives only 6.45 bbl.

R. A. Riester of the Elliott Company claims that this 2500-hp gas turbine is more efficient than a steam plant of similar capacity, and approaches diesel engine performance. He pointed out that there are many combinations of turbines, compressors, combustion chambers, intercoolers and regenerators which can be used to produce a good workable gas turbine plant. These range from the simplest group, consisting of one turbine, one compressor and one combustion chamber, to the more complex schemes combining several of each of these units with supplementary intercoolers and a regenerator.

A regenerator has the greatest single effect in raising the efficiency of the machine. The addition of an intercooler and a second combustion chamber as well as a second turbine increases the economy. While the use of still another stage of intercooling and reheat is advantageous, the gain is progressively smaller, but as the number of elements are increased they become reduced in size and facilitate manufacture.

The Cycle

An evaluation of these factors decided the company to build a plant composed of two turbines, two compressors with their intercooling arrangements, two combustion chambers and a regenerator. The low-pressure compressor draws in free air, compressing it to 43 psi absolute, and raising the temperature to 300° F. This air passes through an intercooler into the high-pressure compressor and is raised to 96 psi. Next the air passes through the regenerator, where a portion of the heat in the exhaust gas is recovered before the air enters the high-pressure combustion chamber.

Fuel oil is burned directly in the air stream of the high-pressure combustion chamber, raising the temperature to 1230° F. at the entrance of the high-pressure turbine, where the heated gas is expanded to 53 psi. This develops sufficient power to drive the low-pressure compressor.

Then the air from the high-pressure turbine exhaust is reheated in the low-pressure combustion chamber to 1207° F. before it is expanded in the low-pressure turbine. In this low-pressure turbine 5000 hp is developed, of which 2500 hp is used in driving the high-pressure compressor, leaving 2500 shp available for driving the propeller or a generator.

After the gas leaves the low-pressure turbine at slightly above atmospheric pressure it passes through the regenerator, where it pre-heats the freshly compressed air from the high-pressure compressor, and passes up the ship's stack at a temperature of 400° F.

The two compressors are driven by separate turbines. This is not essential, but is desirable for naval installations, where special operating conditions occur, such as cruising at less than full speed for 90 per cent of the time at sea. The greatest efficiency is reached when the temperature of the compressed air is as high as possible before being put to work in the turbines. Hence it is best to reduce running power by decreasing the supply of compressed air rather than lower the gas temperature.

Expansion Problems

With the Elliott design both the high- and low-pressure turbines are solidly mounted at their exhaust ends, all expansions taking place toward the inlet, the floating ends being secured by means of freely moving links. Relative movement between the turbines and the compressors is absorbed by double flexible couplings and long-torque jackshafts. For the piping, a new type of expansion joint was developed, because those of the conventional type in small enough sizes were not found satisfactory for the temperature and pressure range.

For instance, the temperature at the inlet of the turbine reaches 1230° F., yet at a point about ten inches

away the temperature of the metal must be below 200° F., because of the main shaft bearings. Therefore special methods were employed to prevent free conduct of heat at such places. Heat dams and special oil cooling at the bearings, and air cooled pin rings were adopted. These ring pins support the full weight of the turbine; but the design enables a drop of 600° F. to take place in the connections between them and the casing. This is accomplished through small areas of contact, reduced metal sections and some carefully placed air cooling on the inside of the pin rings.

A heat problem also exists in the bearing casings, where there is a further temperature drop. The inside flange of the bearing casing reaches 550° to 600° F.; but five inches away the temperature can only be allowed to reach 200° F. To prevent excessive and uneven temperature strains the walls have been given symmetrical and uniform sections. The shaft, equipped with a radiation shield, had to be designed along similar lines.

It was found imperative to devise a method for getting the machines unbolted after they had been operated at running temperatures, due to the fact that the stainless steel alloys essential for the turbines have the undesirable characteristics of galling when two parts are assembled together and subjected to heat. Nuts and bolts could not be taken off unless a suitable compound was put on the threads before placing in position. For this purpose a special colloidal compound was devised, ordinary products being unsatisfactory.

Material Problems

The finding, or selection, of suitable materials for the gas turbine plant and their welding formed very difficult and serious problems for the Elliott engineers. Some of the manufacturing problems, and how they were overcome, were told to the observers at the demonstration run by J. F. Cunningham, Jr. Details of these would form an article in itself, and space prevents a full discussion of them at this time. Not only was the question of welding vital, but there was a reduction of the strength of the metal at the high temperatures, and creep entered the picture when the materials were subjected to load and high temperature for prolonged periods. The turbine rotors grew, flat sides bulged and round ducts grew too large and too thin. Designers required materials and loading of such character that distortion would not become harmful before a predetermined time, in terms of hours of operation. This entailed extremely close cooperation between all manufacturing divisions of the company, as well as with concerns supplying metals.

In designing the rotors for the large Lysholm compressors, it was necessary to use steel shafts in conjunction with cast-iron rotors, which set up an assembly problem. Finally it was decided to use low-temperature brazing (silver soldering), which hitherto had been little used for parts as large as these rotors. Tests were made and a way was found of properly placing the brazing material, and a satisfactory method of cleaning and fluxing the same was developed. Then a heating cycle procedure was set up which assured good silver-brazed joints when attaching the stub shafts in the rotors.

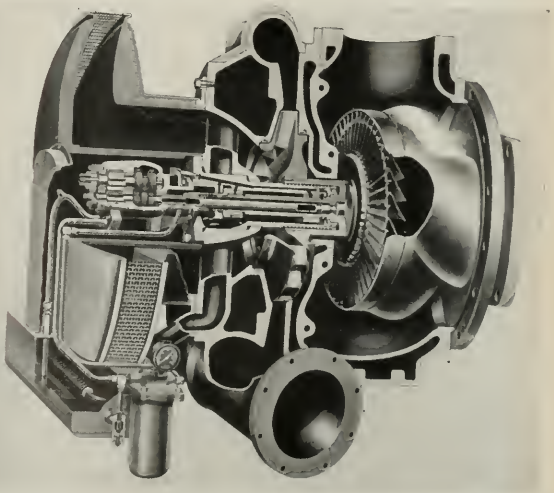
As a result of the numerous studies of heat problems, the Elliott engineers feel that the biggest gap has been bridged with the completion and tests of this first 2500-hp unit, although it is appreciated that as the temperatures and powers of future turbines increase the manufacturing problems will become more difficult.

Future

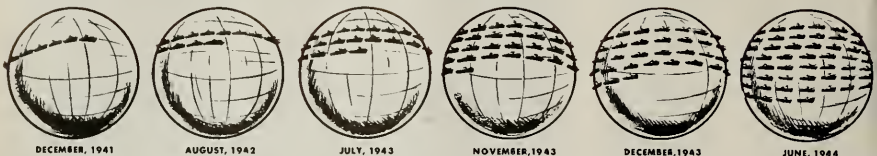
Ronald B. Smith, Elliott's vice president of engineering, discussed future applications of the gas turbine, and pointed out its suitability for mobile or packaged power for use where it can be easily transported, set up on sites, and immediately put to work. For locomotives, studies are now being made to develop turbines which will run on coal gas as well as on oil. While it is fairly certain that units greater than 2500 hp will be built and are practical, there is reasonable doubt that either the very small or very large gas turbine will be commonplace within our time.

For marine propulsive power the low weight and the small space required make this prime mover advantageous. Slight deviations of load-speed can ideally be taken care of by a variable pitch propeller, which also will provide astern operation. Elliott is not taking contracts to build these units until this type of gas turbine has had practical demonstration of success under active sea conditions.

Sectional view of turbo supercharger for diesel engine. Experience with this unit was of great help in developing a successful marine gas turbine.



ADDING OUR STRENGTH TO THE



DECEMBER, 1941
"PEARL HARBOR"
7695 NAVAL VESSELS

AUGUST, 1942
"GUADALCANAL"
12,001 NAVAL VESSELS

JULY, 1943
"AFRICA"
20,111 NAVAL VESSELS

NOVEMBER, 1943
"TARAWA"
29,662 NAVAL VESSELS

DECEMBER, 1943
"NEW BRITAIN"
32,179 NAVAL VESSELS

JUNE, 1944
"NORMANDY"
51,000 NAVAL VESSELS

SHIP REPAIRS

DURING THE PAST five years the shipyards of the Pacific Coast have made new records in efficient, speedy mass production of ships. These records have had ample publicity and the maritime world has come here to see how it was done. Materials and equipment for these ships came in from 128 cities, 38 states. Single shipyards in one year produced tonnage that would be a respectable 50 years' business for a Pacific Coast commercial shipyard.

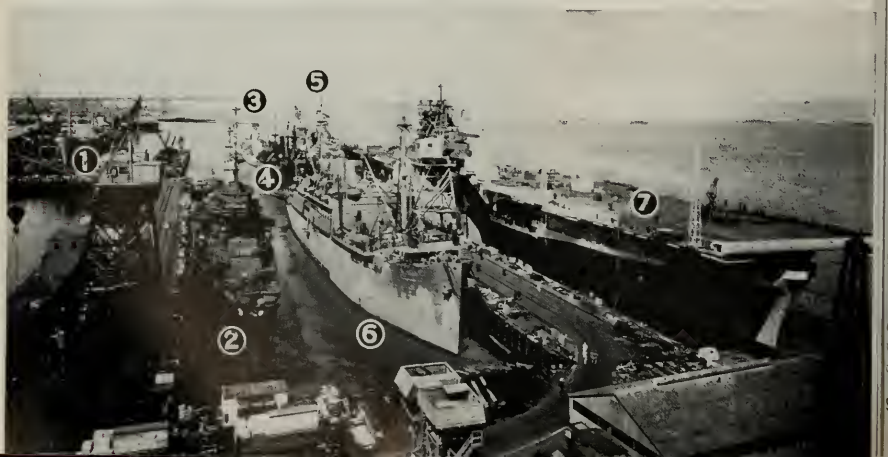
In many of these yards over 90 per cent of the personnel had never previously seen a shipyard. The prefabrication assembly-line erection methods used required a large number of operators, to each of whom was assigned a specific simple repetitive task. Training for these tasks usually consisted of a four to six weeks' intensive course in theory and practice producing a tacker, a welder, a burner, or other craftsman. Thus farmers, store clerks, housewives, men and women, boys and girls, were made into shipyard craftsmen and set to producing ships. Trainees got good wages and graduated as helpers, then shortly became journeymen, then leadermen.

Now the end of the mass production of ships is definitely in sight and many of these war produced shipyard craftsmen are drifting back to other jobs. However, the shipyards are busy and will be increasingly busy not on new ship assembly, but on repairs and overhaul to existing ships.

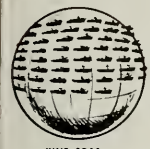
These repairs range all the way from ordinary maintenance to the most extensive battle damage and are now coming in tremendous volume—volume large enough to warrant the conversion of the Maritime Commission's wartime ship assembly plants to 100 per cent ship repair plants.

Fortunately, most of the Pacific Coast ports were fairly well equipped with ship repair facilities during the period before the war. "Lest we forget," herewith is a list of some of the more important of these plants. Those who are familiar with the wartime shipbuilding record will see in

Part of the outfitting wharves of the San Francisco shipyard of Bethlehem Steel Company. Ships shown are: the airplane carrier Essex (7); battleship California (5); motorship Pueblo (6); Victory ship Willard A. Parker (4); cruiser Reno (3); new cruiser Flint — outfitting (2); and 22,380-ton troop transport Admiral W. L. Capps (1)—outfitting. At other wharves and docks, being repaired or outfitted, were two destroyers, three destroyer escorts, two transports, a net tender, a Navy tug, and two freighters of the U.S.S.R.



MIGHTIEST FLEET IN THE WORLD



JUNE, 1944
"SAIPAN"
31,587 NAVAL VESSELS



JULY, 1944
"GUAM"
33,229 NAVAL VESSELS



AUGUST, 1944
"SOUTHERN FRANCE"
38,960 NAVAL VESSELS



JANUARY, 1945
"LUZON"
73,862 NAVAL VESSELS



FEBRUARY, 1945
"IWO JIMA"
80,522 NAVAL VESSELS



MAY, 1945
"OKINAWA"
100,000 NAVAL VESSELS

this list not only some of the wartime leaders in both ship repair and ship construction, but also will note that these firms trained most of the real shipbuilder executives for the newer yards.

Pacific Coast Prewar Steel Ship Repair Plants

Albina Engine & Machine Works
Portland, Oregon

Bethlehem Steel Company
Shipbuilding Division
San Francisco, California
Alameda, California
San Pedro, California

Commercial Iron Works
Portland, Oregon

Craig Shipbuilding Co.
Long Beach, Calif.

General Engineering & Dry Dock Co.
Alameda, Calif.
San Francisco, Calif.

Lake Washington Shipyards
Houghton, Wash.

Los Angeles Shipbuilding & Dry Dock Corp.
San Pedro, Calif.

Moore Dry Dock Co.
Oakland, Calif.
San Francisco, Calif.

Todd Seattle Dry Docks, Inc.
Seattle, Wash.

United Engineering Company
San Francisco, Calif.

The drydocking and ship repair quipment operated by these firms vas ample enough so that practially every pre-war repair or recon-version job of any magnitude was a matter of keen competitive bidding. Notable in this equipment were: the largest commercially operated graving dock in the United States (Hunter's Point, San Francisco, then operated by Bethlehem); the largest marine railway in the United States (then operated by General Engineering & Dry Dock at Oakland, Calif.); and several large floating docks.

For the then Naval fleet on the Pacific range the Navy yards at Mare Island, California; Bremerton, Washington; and Pearl Harbor, Honolulu, had ample facilities to take care of all needed repairs and overhaul.

Among these firms Bethlehem Steel Company and the Moore Dry Dock Company are the pioneers. Bethlehem Steel took over the old Union Iron Works, San Francisco, in 1905, and Moore & Scott, the parent firm of Moore Dry Dock Company, started its shipyard in Oakland during that same year.

Each firm had thoroughly modernized its plant shortly before the war.

During the war Bethlehem shipbuilding facilities on the Pacific Coast were applied exclusively to combatant vessels or to troop transports. Seventy-five warships have been built and 5000 ship repair jobs handled.

Moore Dry Dock Company building partly for the Navy and partly for the Maritime Commission has expanded into one of the largest integrated shipbuilding and ship repair plants on the Pacific Coast. They now cover: 8 shipbuilding ways; 7 drydocks; 22 outfitting or repair berths; 84 shop and office buildings; and 140 acres of land. Vessels built cover a wide variety of hull and equipment ranging from C-3 and C-2 standard U.S.M.C. cargo carriers to seaplane tenders, submarine tenders, Navy hospital ships, largest type landing craft, Navy personnel carriers, and submarine rescue ships. Thousands of ships have been repaired at this yard.

During the great shipbuilding boom and the tremendous shipping movement incident to the logistics of the war, there was an accelerated demand for major and minor ship repairs both in the merchant marine and in the Navy. Both the Maritime

New 14,000-ton floating drydock installed at Consolidated Steel Corporation's Wilmington shipyard. The drydock, of the non-military type, will be used in conjunction with the corporation's Pico, Terminal Island, and San Pedro Lumber Dock ship repair operations. It is 598 feet long, large enough to accommodate a small cruiser, and will be operated for the Navy.





Moonlight view of waterfront of California Shipbuilding Corp., Terminal Island, Los Angeles Harbor. This yard is rapidly being converted into one of the largest ship repair plants on the Coast. (Photo courtesy of U. S. Coast Guard)

Commission and the Bureau of Yards and Docks of U. S. Navy encouraged the organization of ship repair plants. The Navy built and allocated to various firms several large floating drydocks. The Maritime Commission through the War Shipping Administration helped in securing equipment and materials and allocated repair work.

The Navy also tremendously expanded its existing yard plants, and having taken over Hunter's Point Dry Dock from Bethlehem Steel, transformed that site into one of the largest Navy repair plants in America with shops, docks, and cranes, and equipment to take care of any Naval vessel from the largest battleship to the smallest landing craft.

Plant, tooling, equipment and materials are at present available on the Pacific Coast to take care of the existing load of ship repairs. Manpower is the problem most puzzling to the ship repair executives. To this problem the operators in Washington and the press of the nation are giving a great deal of space with comparatively meager results.

Ship repairs require skilled ship craftsmen of considerable experience. The experience of the specialized craftsmen who learned in a month to do one repetitive job on assembly line shipbuilding is of no practical use in general ship repairs. The hastily trained electrician who has installed part of the wiring of a "Liberty" ship is soon lost in a fog when he is up against the complications of a troopship's electric system, or the firing control system on a bombed destroyer.

In such maintenance items as hull painting much streamlining may be accomplished both in the application of the paint and in the preparation of the hull for paint. These methods can easily be adapted to the special problems of diversified hull forms and types of docks.

In actual hull repairs of standardized Maritime Commission vessels of various types it is very possible to make accurate survey of the extent and exact location of damage and radio this information ahead to shipyards that have fabricated the particular type involved. The shipyard, working from its original templets, could then prepare the steel required to repair the damage and when the vessel arrived at drydock the necessary repair parts would be ready to weld into place as soon as the hull could be prepared for that operation. Much work of this type has already been done in the repair of tankers and cargo vessels even in pre-war practice.

The problem of naval vessel maintenance is as tremendous as the Naval fleet and the U. S. Navy has today well over 100,000 vessels of all sizes, types and classes. In a recent address, Rear Admiral Glenn B. Davis, U.S.N., Deputy Commander and Chief of Staff Western Sea Frontier, says:

"When we talk of a hundred thousand ships, let us not forget that when this war is over most of our combat vessels, auxiliaries, and landing craft will be worn ships. We have ships that were built to run 50,000 miles between overhauls and which now have run over 200,000 miles. Plane engines which were constructed to run 800 hours before repairs have operated 2500 hours and more. There is every reason to believe that when the war ends we shall have a gigantic ship repair and plane repair job to do before this equipment is back in condition.

"The damage inflicted on our larger fighting ships, particularly the carriers, by the Kamikaze suicide planes has been repaired with a rapidity thought impossible a few years ago. The ships were soon back at sea and again in the fight. The Japs failed to disrupt or delay our invasion schedule. But just as an automobile is seldom quite the same after it is damaged and then repaired, so is a ship not quite the same—at least until a thorough overhaul is made where the people doing the job are not working against time."

In this item of Naval maintenance alone there is ample work to keep the entire ship repair plant of the Pacific Coast very busy for a few post-war years.

What Admiral Davis has to say about the overdue repairs and overhaul on Naval vessels is equally true of our merchant fleet. Many of the vessels of this fleet have had major hull repairs rushed through in a very short time or have had machinery operating without overhaul for much longer periods than is considered good practice by conservative operators.

All this spells long, active, busy times ahead for Pacific Coast shipyards.



APH 1, U.S.S. Tryan, at anchor in San Francisco Bay.

Converting an APA to an APH

THIS TITLE, indicating a change of one letter in a ship type symbol, would not seem to be much in the way of a conversion job, but the cost of this operation on the U.S.S. Tryon was approximately 1½ millions of dollars and the work time allowed was 64 days. An APA is an Attack Personnel Transport. An APH is an Attack Personnel Hospital. This particular APA was a converted C-2 vessel and so had an overall length of 450 feet, a beam molded of 62 feet and a draft of 25 feet. As an APH her duty would be to take troops in to a landing attack and to stand by to take care of hospitalized troops.

She therefore had to be altered to make accommodation for hospital wards, surgery, surgical dressing rooms, X-ray rooms and all the equipment of a modern hospital, as well as much additional ventilation and air conditioning, boat equipment and boat-handling machinery. She was the first vessel of this type built, and the General Engineering and Dry Dock Company is to be congratulated on the fine job done in producing this pioneer of her type.

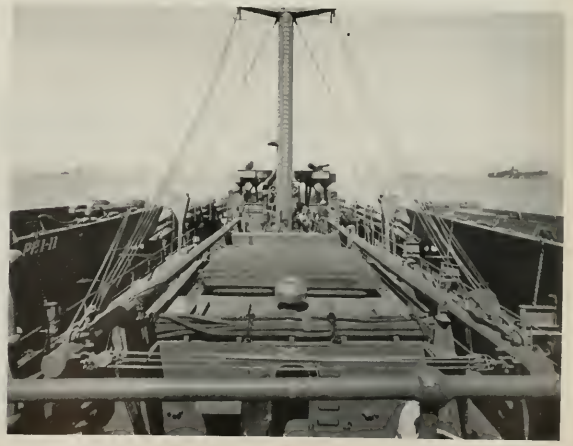
No changes were made in the power plant, but all machinery was given a thorough overhaul.

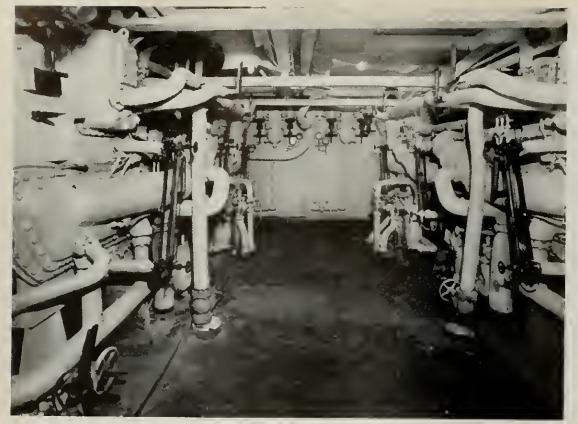
The changes and additions to the hull and equipment are best appreciated if taken by decks, beginning with the bridge.

Bridge Deck

Here a new radar room was built and a combat intelligence control room with all the necessary equipment and instruments. In connection with this, an additional radar mast

Main deck aft of midship house.





This view in evaporator room gives a good idea of the complexities of piping systems.

was built and installed. This meant a lot of rather intricate wiring and installation work, but the GEDDCO craftsmen were more than equal to the task.

On the flying bridge additional anti-aircraft guns and a conning station were installed.

Boat Deck

Six sets of new special type Welin davits were installed and six electric-drive boat winches for handling the 36-foot-long landing craft. Eighteen of these craft are carried, each winch and set of davits handling three boats. Two sets of davits out of the six are on the main deck level, just aft of the midship deckhouse.

Main Deck

A boat shop and a trash burner were installed in the after deckhouse. The trash burner is fitted with a special type stack that consumes all smoke before discharging to atmosphere. New boat booms were installed aft. A new hatchway was cut in the deck aft of the midships deckhouse for convenience in handling stretcher cases. The paravane gear installation forward was completely modified and brought up to date.

Second Deck

On this level the biggest part of the conversion work was done. Four new hospital wards were installed complete for 104 patients; operating rooms with complete equipment; surgical dressing rooms; X-ray and therapeutical rooms; with all the equipment that goes into a modern hospital establishment. All of these rooms had to be equipped and fitted for special mechanical ventilation, and all the hospital and operating spaces were fully air conditioned. Various other structural changes and additions were made, including four strong rooms for violent cases, an interior communications room, new boatswains stores, and a new seamen's lavatory.

Third Deck

Here was located a mental ward equipped with everything necessary for modern mental therapy. This ward is on the starboard side and has capacity for 27 patients. On the port side, new hospital wards were installed to take care of 135 patients. The whole berthing arrangement on this deck was revamped to allow for this additional hospital accommodation.

First Platform

On this level forward a new paint store was added. Aft four diesel oil tanks were built into the space formerly occupied by two fresh water tanks.

Additional Freon compressors, condensers, and circulating pumps were installed in the evaporator room to take care of the air conditioning load.

In the hold additional ballast was installed and the anti-aircraft ammunition magazines were modified to give greater capacity.

When the U.S.S. Tryon was delivered by GEDDCO she was APH-1 in Navy designation, the first of the Attack Personnel Hospital type. Her accommodations have a capacity for housing and caring for a total complement of 1620, classified as follows: officers, 48; petty officers, 19; crew, 452; hospital ward, 104; 2nd deck wards, 123; convalescent wards, 52; minor injuries berthing, 789; mental ward, 27; strong rooms, 4.

All of this work was performed satisfactorily under the exacting requirements and inspection of the Navy, and the ship was delivered complete well within the time limit set.

Approximately 950 men and women on the ship and 350 in the shops cooperated on this job. Twenty-three crafts were represented. Said Captain M. M. Dana, Production Officer of A.I.M., 12th Naval District:

"Patriotism is not something you wear like a badge or that shows in a man's face, but it does show in the way men work, the way they do a good job better or meet the challenge of a stiff time schedule. It shows most in team work, and the war in the Pacific is the greatest show of teamwork in the history of man. The job just completed at GEDDCO shows you are not just back of the team, you are part of the team."

ON THE FACING PAGE:

(1) Captain's cabin.

(2) Hall and stairway.

(3) One of the special type Welin davits for handling 36-foot LCVP's.

(4) Main deck forward is shipshape.

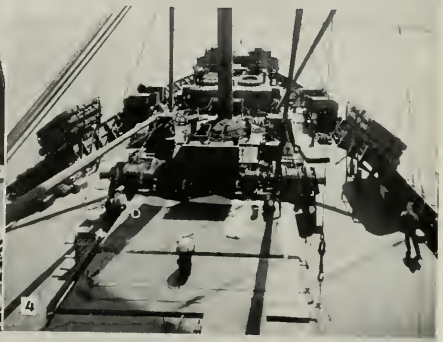
(5) Bunks in troop quarters.

(6) Refrigeration machinery.

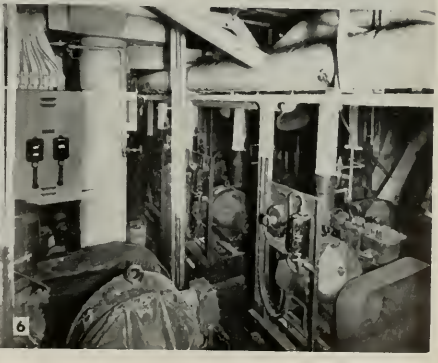












Converting Cargo Ships To Floating Canneries



The name plate the Chernyshevski proudly bears while busily engaged in fishing 5000 miles away from Oakland, California.

COOPERATION WITH our Russian allies has brought to Pacific Coast shipyards and repair plants a large business in the repair and conversion of Russian ships. Probably the most interesting examples of this work are the conversions of cargo vessels to floating fish canneries for use in the Siberian coastal fisheries. Several of these conversions were made in a shipyard on the Oakland estuary, owned and operated by a native son, Jack Hurley, Jr.

In conjunction with a heavy schedule of ship repair and conversion of both the U. S. Navy and War Shipping Administration vessels, the Hurley Marine Works has handled major repairs or complete conversions on some 40 Russian vessels.

Among the Russian vessels on which this yard made major repairs or conversions were the Chernyshevski, Menjinski, Krabolov No. 2, Chapaev, Koryak, Refrigerator No. 1, Refrigerator No. 2, Pischevya Industria, Lieut. Schmidt, Khabarovsk, Tanker No. 1, Pravda, Leningrad, Karl Liebnecht, Lafayette, and Transbalt. The last named is Russia's largest vessel.

Hurley's started their first work on U.S.S.R. vessels back in the fall of 1942. Their first task was to convert Krabolov No. 2 into a cannery and make the cargo freighter Chapaev into a cannery supply ship.

When Menjinski sailed through the Golden Gate for Russia on July 18, 1945, she was off to keep a rendezvous date with her twin sister Chernyshevski. The latter had sailed for Russia on April 27th.

Both vessels had been converted at Hurley's. Both were so much alike in structure and tonnage that Hurley's converted the vessels along the same lines and general arrangements. Machinery and auxiliaries were duplicated in most instances.

This article is a description of the work done on Chernyshevski. Originally built in Rotterdam, Holland, in 1919 by De Rotterdamsche Droogdok My, she served well under the Dutch flag and when Holland was invaded by Germany in World War II, got safely away to England.

Some time later England had the ship transferred to Russia for the Murmansk run to the Arctic. After Russia had broken clear of the Nazi deathgrip and started to take the offensive, this ship along with many

ON THE FACING PAGE:

(1) A shot made while the Chernyshevski was getting its bow plates renewed.

(2) How the modern cannery looks on the ship. The unit in the foreground is the can washer, designed and built at Hurley's. The other three units—the can clincher, the can washer, and the vacuum pump—are American Can equipment.

(3) The officers' dining saloon as built by the yard.

(4) Joiners completing the inspection and can packing conveyor table.

(5) The Russian construction engineer on the right is checking the lacquer unit built by the sheet metal department. The other two persons in the picture are sheet metal workers.

(6) Leaderman George Mantague of the machinists winding up his work on the can washer that was designed and built at Hurley's.

(7) An electrician making final hook-up on the controllers for the cannery equipment.

(8) The ship's six retorts getting final inspection. All ventilation, piping and electrical wiring was done by company craftsmen.



President Jack Hurley, Jr., of Hurley Marine Works, Inc., Oakland, California, in whose shipyard the conversion of the Chernyshevski took place. (Photo by Colbourn Studio)

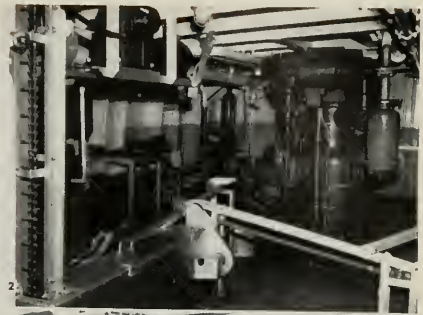


Tom Brooke, Works Manager, whose production department converted the Russian cargo freighter into a floating cannery.



H. O. Shuster, Chief Engineer, and Naval Architect, in whose department all conversion plans were drawn.





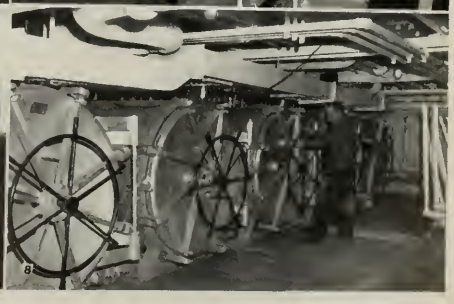


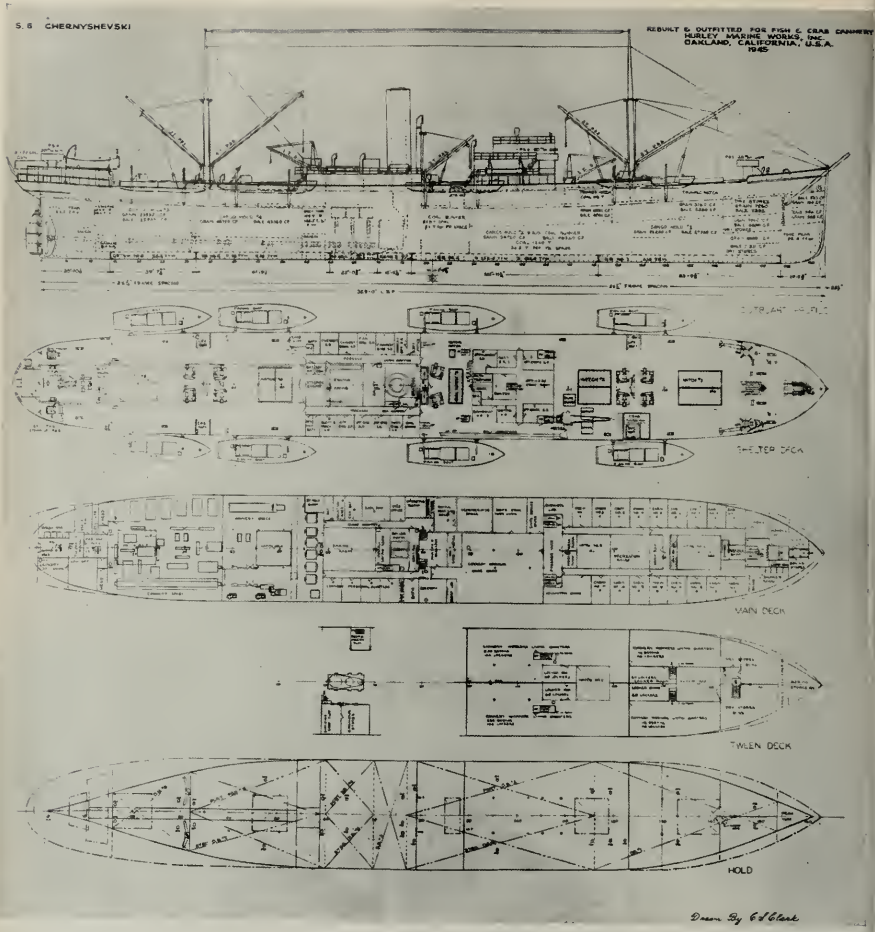












How extensive was the conversion of the Chernyshevski for the Russian Government can be see in this capacity plan and the arrangement plan as drawn by the company's engineering department.

others was transferred to Asiatic waters.

In July of 1944 she sailed to America and the Pacific Coast. When both governments decided that she should be converted from a cargo freighter to a crab and fish cannery on Lend-Lease account, Hurley's at Oakland was selected to make the conversion.

Her principal characteristics are: dead weight, 5533 tons; light ship displacement, 3255 tons; length overall, 372 feet; length B.P., 359 feet; beam molded, 50 feet; depth molded, 24 feet, 6 inches; load draft, 21 feet, 7 inches; loaded displacement, 8788 long tons.

She is powered by a triple expansion steam engine 25″–41″–67″ bore x 45″ stroke. Her three coal burning Scotch marine type boilers 13′–6″ x 11′–0″ generate steam at 180 psi.

As a floating cannery she berths and feeds 800 workers and crew members; utilizes the most modern cannery machinery to produce millions of cans of crab and fish in a season; and is able to store considerable of this product for shipment.

All structural conversion plans were drawn by the engineering de-

partment, headed by H. O. Shuster, Chief Engineer and Naval Architect. His chief draftsman on this project was Wayne Heinbockel.

Tom Brooke, works manager, headed the production department that performed the work. His assistants are Jesse Johnson, general superintendent; Guss Sjoberg, hull superintendent; J. D. Macdonald, marine superintendent; and Charles Lillard, chief coordinator.

Detail Changes

Coal bunkers on port and starboard sides of the engine room were replaced: on the starboard side by a generator flat, and above this a machine shop, on the port side by a water plant, and above this a refrigeration machine room. A large coal bunker was installed forward of the forward engine room bulkhead. Considerable shell plating was renewed especially at the bow.

The whole ship was repiped with the exception of the main steam line to the engine. This meant a salt water piping job to the cannery; a new steam heating system throughout the ship; and a new fresh water system throughout the ship.

A new 'tween deck forward was built to provide berthing accommodations for 708 men and women workers. The main deck was converted into living quarters forward and into a cannery aft of the engine room trunk.

The shelter deck was arranged to provide ample open work areas and in the superstructures housing accommodations for crew members. Two midship houses ae provided. The forward house carries boat and bridge decks and accommodates the deck officers and the officers' mess. The after midship house surrounds the engine casing and accommodates the engineer and cannery officers.

Much of the cannery machinery and equipment was designed and built at Hurley's, including the cutters, can washer, can tray loaders, lacquer unit, transfer and retort cars, and many conveyors.

Outside contractors built the one-ton caterpillar crane, the can cooler, can clincher and can closing machines, and the elevators. Hurley machinists made all installations.

The heart of the cannery is centered in the No. 4 and No. 5 holds on main deck.

Every shipyard craft was employed on this job. The pipe shop manufactured all the expansion joints, and put in all the steam, water and sludge lines.

All the electrical work was done at the yard from building the switchboards and calibrating instruments to wiring the ship throughout for lighting and power. All ventilation duct work was built here. This was a tricky job, the problem being to keep cannery workers' quarters free of steam and dampness, and to remove all vapor in the cannery in the quickest possible time.

More than 230,500 board feet of lumber and 46,054 square feet of plyboard were fabricated by the joiners and carpenters. Three hundred fifty-two six-foot lockers and furniture complete for the chemical laboratory, the hospital, the operating room, the business offices, and all the ship and cannery department head staterooms were made in Hurley shops.



New bow view of the ship following conversion.

During the course of the job the following Russian officials represented their government: Admiral Akoulin of Washington, D. C.; Eugene Privalov, in charge of Russian ships on the Pacific Coast; Basil Lobanov, port engineer stationed at San Francisco; M. V. Shalnikov, in charge of the Russian Fishing Fleet; and Lt. Comdr. Luka Markovich Zaporojchenko, in charge of Armament.

Herbert Berger represented the U. S. War Shipping Administration in following the contract through its entirety.

A port side view of the ship taken shortly before she sailed for distant Vladivostok.



Streamlining The Bottom Paint Job



From south end of dock looking almost straight up at 32-foot-high sandblast pressure unit, one sees two access manholes and air supply pipes.

Speed is the essence of maritime warfare, and speed is the essence of the shipbuilding records piled up at the shipyards across San Francisco Bay at Richmond. The critical need for present-day strategy in the South Pacific is the fast drydocking and repairing of vessels, home after many arduous months at sea, so that they may be returned immediately to service.

In the four months since the first ship was floated into one of its five huge steel and concrete graving docks recently converted from new ship construction to repairs, Yard Three of Kaiser Company, Inc., has already improvised methods to hasten the restoration of ships, sound and seaworthy, to the battle fleet.

Typical sandblasting nozzle.



Most time-consuming on the drydocking schedule is the painting of ship bottoms. With excellent facilities and three years' training and experience in organization and coordination, the workers of Yard Three have turned out a commercial paint job in ten hours.

However, most revolutionary in new techniques are the facilities under way for preparation of the vessel for the application of the Navy's Hot Plastic paint, the comparatively recent development for anti-fouling protection. Sandblasting has long been recognized as one of the most effective means for cleaning metal surfaces, and by September 1, when all the newly designed and tested equipment will be in, the ordinary type of ship can be sandblasted in four hours as against the 16 to 24 now consumed.

Up to the present time Yard Three has employed equipment that was brought from Grand Coulee Dam and refitted for drydock use. Larger than the conventional sandblasting pots, these have a capacity of four yards of sand with four outlets for blasting hose and nozzles. Impatient at the time loss in the reloading routine, which necessitates the shutdown of the machinery, Yard Three engineers have designed a double-acting, continuous-operating pot with two chambers that can be refilled while it is running.

To be permanently installed on the craneways above the basins, three of the pots will be located at strategic points along each side of the graving dock. Each is fitted with four valves, all operated from one position, and with four men handling hoses from one, 24 in all will be able to blast the whole vessel's underwater area simultaneously. In fact, successful experiments have turned out one square foot of blasting in two seconds, 30 per minute, or 720 from all six pots. The large air capacity available makes possible the greater production, and for the best coverage of the ship, two outlets will use 1½-inch hose for the first 50 feet, and one-inch for the remaining 100 feet, while the other two will be connected with 50 feet of 1½ and an equal length of one-inch.

Greatest boon of the new design is that the sand chamber can be filled directly by dump truck without interruption of its operation. This method also insures clean sand which goes through a strainer from the truck to guard against possible stoppage.

A second advantage over the traditional equipment is the avoidance of movement and clutter. Fewer men are needed for the reloading routine, and the hoses, when not in use, remain coiled on the 12-foot mezzanine of the basin, with no extraneous workers and absolutely no equipment impeding progress on the floor of the drydock.

The sandblasting set-up will also facilitate preparation of the ship for commercial painting. At the present time, this is a hand-scraping proposition. But the brush-blasting method can be used with the new equipment to finish a scraping job in less than half the present eight hours with one-half the personnel. The worker, in this case, will hold a sandblasting nozzle far enough away to clean evenly and smoothly down to a good underneath paint surface.

Two weeks following complete installation of the sandblasting machinery for two of the basins, Yard Three

engineers expect to have in readiness their specially designed piping system and melting pots for applying Hot Plastic. This thermoplastic solid anti-fouling composition, when properly put on, protects the ship bottom for approximately two years, an important advantage when speed and cruising range are vital to naval operations. Drydocking for a "shave and haircut," as a paint job and check on underwater features are called, has been necessarily limited because of the time element involved, but the entire process, including the flooding of the basin, berthing, and pumping out will now be accomplished in 24 hours.

Usual equipment for Hot Plastic consists of a melting kettle and an electrically heated spray unit and hose. The proposed system will do away with the heating kettle and portable spray pots and will add the installation of a permanent piping system on the inside wall of the repair dock. The outer pipe will carry hot water under pressure, and the inner conduit will carry the plastic maintained at 300° Fahrenheit. From 16 outlets, hoses can be attached for handling by spray painters.

The new melting pots, which will remain stable on the mezzanine level, will accommodate an entire drum of plastic, thus eliminating the chopping up of the mass for the customary small container. A chute from the craneway takes the drum from truck to melting kettle. Again, fewer man-hours will be involved because of the simplicity of the system, and the equipment will have a capacity for applying 8000 pounds of plastic in one hour.

The Navy considers its Hot Plastic, with its great protective qualities, to be a weapon as vital technologically as radar, and a Navy spokesman has declared the set-up for its application soon to be ready at Kaiser Yard Three to be a time-saving pace-setter for the nation.



Operator sandblasts a portion of ship's underwater surface.



Operator sandblasts higher area from vantage point on portable staging.



Washing operation, which follows sandblasting, removes grit that has adhered.



Flat top Kadashan Bay on floating dock, United Engineering Company plant, Alamedo, California.

Repair of U. S. S. Kadashan Bay

By E. J. Wegener

The Kamikaze was not able to stop our naval offensive headed for the Japanese home islands, but many of our ships, both naval and merchant, were hit and badly damaged by the suicidc planes manned by enemy desperadoes. It became the duty of our West Coast shipyards to repair these damaged ships in the shortest possible time to get them back in the service where they were so urgently needed.

The U.S.S. Kadashan Bay, an escort carrier, was recently repaired in the yards of United Engineering Company, Alameda, California, after having suffered a hit by a Kamikaze in an engagement in Philippine waters. When this particular ship was hit, there was only one fatal casualty: the Jap pilot; only one American was wounded. The plane that got through our anti-aircraft fire hit the starboard side of the ship just above the waterline and slightly forward of amidships in the junior officers' quarters. A large hole was punched in the carrier's shell plating by the plane, and as its bombs exploded and the gasoline was ignited, the whole compartment was transformed into a blazing inferno within a few seconds. The attack occurred during "general quarters," when everyone was at his battle station and only one junior officer was in the stricken part of the vessel at the time. All access hatches and doors to the compartment were closed, of course, but somehow the officer escaped through the hole in the ship's side made by the Jap plane. He was picked up by an escorting destroyer and lived to tell about his miraculous escape.

One of the welded bukheads separating the compartment in which the fire occurred from a compartment containing much combustible matter was badly dented and buckled by the impact of the Jap's motor, but there were no penetrations or even leaks through which fire could spread, and this undoubtedly saved the ship. It is not considered probable that a riveted bulkhead would have remained tight after receiving punishment of such force and magnitude.

When the fire was extinguished, there was nothing left in the damaged space but a twisted mass of wreckage. All the personal belongings of the officers, and their berths, bedding, lockers, furniture, and all other gear, as well as the electrical installations, and the ventilation systems in the compartment, were completely destroyed. The heavy structural members of the vessel and her decks and bulkheads were bent, buckled and torn, and there was the large gaping hole in the ship's side a few feet above the waterline.

Beside the major damage in the junior officers' quarters and the near adjoining spaces, flying missiles from the explosion caused minor damage within a wide area.

It was necessary to bring the ship back to an advance base for temporary repairs before the long voyage home across the Pacific Ocean could be undertaken. All the debris was removed from the damaged compartments, the large hole in the ship's side was closed by means of a large welded patch plate, and some of the damaged bulkheads were reinforced.

Upon arrival of the vessel at "United's" yard in Alameda, the extent of the permanent repairs was determined and work was commenced immediately.

Drawings of the vessel's structure and equipment were examined to determine the types and quantities of material required for the rebuilding of the parts that had been destroyed, and the replacement materials were ordered immediately. The Navy requires that in any repair job of a combatant vessel the replacements must, as near as possible, be identical with the original materials used in the construction of the vessel. The procurement of such materials for repair work often becomes a difficult problem, due to the time element and to the special nature of many of these items.

In the meantime, the damaged parts of the vessel were removed by burning and other means, templates were prepared for the new parts, and parts were fabricated, fitted and erected in place, piece by piece. It is not possible in a job of this nature to use prefabricated and preassembled sections to any extent. In some cases it was found that plating that had been bent could be refitted in place after straightening and other parts could be faired in place. After the steel work had been erected and re-

welded, the sheet metal men started their work installing the partitions, ventilation ducts and other sheet metal work that had to be renewed. The pipefitters then commenced their work, renewing and reconnecting pipe lines and plumbing installations that had been destroyed by the explosion and fire or dismantled during the repairs. Next the electricians ran cables and wireways and installed boxes and fixtures. Metal furniture was then installed by the joiners, and finally the painters could complete the job of restoring the damaged or devastated compartments to their original condition.

Due to the nature of the service of a carrier in the war zone, it is naturally not possible for the ship's crew to take care of all the maintenance work normally accomplished under peacetime conditions. Therefore, concurrently with the battle damage repairs, the ship, her main and auxiliary machinery, and the mechanical and electrical equipment were thoroughly overhauled.

Furthermore a large number of improvements were carried out. Several new ventilation systems were added as war experience had indicated was necessary for work in the tropics. The ship's fire-fighting systems were brought up to the latest Navy standards by the installation of new lines and connections. In addition, the installations for handling aviation gasoline for the carrier's planes were rearranged and expanded in order to facilitate and expedite fueling operations. Improvements and additions were made to the telephone and radio systems, and the very latest in radar was added to the ship's existing equipment.

These and many other changes and modifications all contributed to increase the carrier's military efficiency, so that when the ship went back into service after a few weeks at United Engineering's yard, she was actually a better ship than before she was hit by the Kamikaze.

Radio Echo Ranging



H. J. W. Fay, president of Submarine Signal Co.

The modern miracle of radar is now a sober commercial reality, according to Harold J. W. Fay, president of the Submarine Signal Company, Boston, in a statement to the nation's press, following the lifting of the Navy Department's secrecy ban on the company's Radameter.

The Radameter "sees" through darkness, fog, rain and snow for varied distances. All models built so far have been taken by the fighting ships of the Navy, but future ones are expected to be standard equipment on most merchant vessels. Their electronic magic will eliminate the hazard of collision in the open sea or in congested harbors, no matter what the time of day or prevailing atmospheric conditions. When ships do become disabled through fire or through engine trouble, rescue of the crews and passengers will take place as easily when the stricken ships are totally obscured as under conditions of broad daylight.

A fully automatic apparatus, the Radameter operates by beaming a short wave radio impulse away from the ship. The impulse bounces back as an "echo" when it hits any obstruction on the water. With incredible precision, it automatically times the return of the radio impulse and notes the direction from which it comes. Since radio waves travel at the rate of 186,000 miles per second, the speed of light, and since the apparatus sends out thousands of impulses every second, the timing device has to be hundreds of thousands of times as fast and as accurate as the most accurate stopwatch. The second is too big a unit of time to be used by the radar engineer, who measures

The Radameter.



time in "microseconds." The microsecond is one millionth of a second!

Despite the complexity of the inner workings, all the operator has to do is to whirl a knob or two and look at a circular dial. There, glowing blue-green rings and "pips" of light show him the distance and compass bearing of all objects on the waters around him. The center of the dial represents the location of his ship; and the operator can see how fast the distance closes in between his own vessel and other objects. Moving objects, of course, trace a path across the face of the dial more quickly than do stationary objects. Under battle conditions, our naval radar operators were able to watch radar-aimed shells close with enemy ships and thereby to direct gunfire, all under the cover of night. When the pips disappeared, the targets had been sunk. Incoming ships and planes are instantaneously identified by means of the radar IFF (Identification Friend or Foe) system, so that our ships never fired by accident on friendly ships or planes. The whole commercial model, except for the antenna, is mounted in one cabinet about the size and shape of an ordinary four-drawer file. The operation is known as "radio echo ranging."

Submarine Signal has been working on radio echo ranging for more than twenty years, ever since the company came out with the first practical echo ranging device immediately following the first world war. This device was the Fathometer, which sends sound wave impulses under water and times their return as echoes. It gives a constant indication of the depth of water beneath a vessel, and is used for navigation, for locating fishing grounds and for making accurate surveys of the ocean bottom. Echo ranging by sound waves is known as "sonar," as against "radar," which is echo ranging by radio waves.

Sound waves travel in water at a rate a little bit slower than one mile per second. Radio waves travel two hundred thousand times as fast, so that perfecting the simple-to-operate Radameter had to wait upon the development of radio tubes and television apparatus not available immediately after World War I. Submarine Signal did, however, establish a system of synchronous signaling which enabled mariners to find their direction and distance from lightships and other fixed points along seacoasts. The lightships sent out simultaneous radio and underwater sound signals, and the difference in the time of arrival of the two signals gave vessels their distance from these known points. The significance of the Radameter is that now any vessel, anywhere, can tell where it is with respect to anything within possibly hazardous range. The measurement of distance is the key to safe navigation and prevention of collision. At its foundation, the company was set up to deal with the problem of distance from maritime hazard. More than forty years of intense concentration on this problem have brought about one answer after another. Together, the Fathometer and Radameter provide all necessary answers.

Ramie Stern Tube Packing

Ramie, a remarkable plant fiber that promises post-war textiles of superior strength, wearing qualities and other important advantages, is now being produced on a commercial scale from huge plantings in the Florida Everglades.

The story behind its development begins in China, where the thistle-like ramie plant commonly grows. Known as China Grass, the plant produces long, soft fibers greatly superior in strength to flax, cotton or wool. The problem has always been to remove the hard outer plant covering, and much time and money have been spent in attempts to develop a successful "decorticating" machine. Early in the war, models of crudely-made Japanese decorticating machines were captured in the South Pacific; the principle upon which these worked showed great promise, and American development engineers speedily created efficient power-operated decorticators based upon the Japanese attempts.

Among the large firms cooperating in the production of this important fiber for wartime uses is Johns-Manville, who recently announced the development of a new stern tube packing made from ramie fibers. Among the superior qualities resulting from the use of ramie for stern tube packing are its resilience under all conditions, greater lubricant retention, resistance to mildew and rot, and non-abrasiveness.

AT GENERAL ENGINEERING and DRY DOCK

View of the Alameda yard of General Engineering and Dry Dock Company as seen from Government Island, showing the floating dry dock at left, outfitting docks, marine railway, and the ways at right.



A New Repair Yard

The property known as the Mariposa yard, located at the foot of Mariposa and Illinois Streets, San Francisco, just north of the Bethlehem yard, and owned and operated until recently by the Martinolich interests, was acquired during June by Harry W. Parsons, Inc., and will be operated as a ship and industrial repair yard.

At the yard, which covers an area of over three acres, with deep water docks capable of handling any ship up to and including the Victory type, complete facilities are also available to handle marine engine and boiler repairs.

H. W. Parsons, Inc., has been in business for about three years doing ship repairs and specialized work on main and auxiliary engine and fire room equipment. During that time the firm has built up an organization of skilled craftsmen and experienced supervisors well qualified to serve the shipping and industrial interests.

The officers of the company are: Harry W. Parsons, president; Parker M. Robinson, vice president; and R. J. Luick, secretary and treasurer.

Mr. Parsons, a native of Sacramento, is a graduate of Gulf Engineering School and has held executive positions with the construction and marine departments of the General Electric Company, with John R. Proctor Engineering Company, and was assistant manager of the marine department of Foster Wheeler Corporation. He is also president of Parsons Refractory Corporation. While residing in New Orleans he was elected National President of the Propeller Club of the United States. His technical society affiliations are the Society of Naval Architects and Marine Engineers, and the American Society of Military Engineers.

Mr. Robinson, a Bostonian, is a

(Page 554, please)







Top to bottom: Harry W. Parsons, president, and past national president, Propeller Club of the U. S.; Parker M. Robinson, vice president, and R. J. Luick, secretary and treasurer.

A couple of freighters in for overhaul at Mariposa Shipyard.



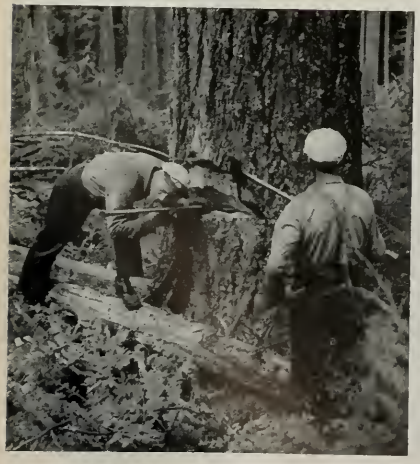
Giving the Navy The Big Stick

By Arthur W. Priaulx

Big sticks are the backbone of the nation's fleet of minesweepers, clippers, patrol craft, and the variety of small ships which make up our squadrons, for these ships are built from the keel up. In the past year more than 1000 keel sticks over 80 feet long have been produced at Westport (Oregon) Lumber Company, and according to Lester J. Harding, resident manager, the mill has turned out at least that many big timbers each year since before Pearl Harbor.

For nearly 100 years a sawmill has operated on the site of the present Westport mill, says Myron C. Woodard, pioneer Oregon lumberman. Mills have burned down but always been rebuilt. Today the 30,000 feet per hour capacity of the mill can be shipped either by ocean-going freighter or by railroad. Three freighters can dock along its lumber-laden docks at one time, and often did during the war, when lumber was needed to rebuild Manila and Pearl Harbor and for other Pacific war tasks.

Mr. Woodard and his associates have won the Army-Navy "E" pennant for all-out participation in the war, but although they have turned out a variety of war orders and thousands of carloads of timbers of all sizes, they are most proud of the big sticks. Two large logging firms, Consolidated Timber Company, in Oregon, and Weyerhaeuser Timber Company at Longview, have supplied most of the large logs from which the big timbers are cut. A special log must be used, one with a minimum of taper, one straight and true without a flaw.



Olsan and Johnsan, a set af fallers an Consolidated Timber Campany aperations, use care in falling this Douglas fir giant, which may finish aut its life as the keel an ane af Uncle Sam's smaller war craft. This tree will fall an a bed af baughs ta prevent break and stress.

Trees are selected in the woods as possible source of keel sticks. Fallers then prepare a bed and drop the tree with greatest care, for there can be no stress or break in the full length of the forest giant. So large and heavy are these trees that it takes two heavy tractors, pulling in tandem, to get them from woods to river. Logs from which the 112-foot timbers were cut measured 40 inches at the butt, and not less than 24 inches at the top, contained from 5000 to 9000 board feet of lumber, and were 118 feet long.

Cutting one of these big timbers is one of the most difficult tasks confronting a sawmill. Maximum length of log which the 1250 sawmills of the West Coast industry ordinarily can handle is 60 feet. At Westport, when huge trees 118 feet long are carefully dragged into the sawmill from the pond, a special pony or trailer carriage is needed to carry the extra length of the log. To give the timber maximum strength the heart of the tree must be in the dead center of the finished timber, and this requires much juggling of the log by experienced Harry Boyd, head sawyer. Once through the saw at the headrig, the squared timber must be gentled through the planer, which will take a maximum piece 24 by 36 inches and surface all four sides.

Howard T. Lydick, plant superintendent, hovers around like a hen watching a lone chick all the time the big logs are going through the mill, for the company has plenty invested in these extra long giants of the forest and one slip could ruin the keel of a speedy craft and reduce the big stick into smaller, less valuable timbers.



112-foot-long 14" x 16" Douglas fir sticks at the Westport (Oregon) Lumber Company for shipment to Benson Lumber Company, San Diego, California.

Final chapter in the life of a big stick at Westport sawmill is in the loading yard. Here a squat, husky crane picks the stick up in a chain cradle and drops it into place along with 17 other equal-sized timbers on a triple carload. Middle railroad car carries no weight, is used to space out the other two, which are carefully equipped with bunks to carry the long sticks. Also, the middle car being free, it will take the curves on the journey to shipyards, taking up the differential.

When word goes out that "the big sticks are coming," something happens among these skilled sawmill men. A sort of electric charge goes down the line from pond man through sawmill and planer crews, on out to the yard. When the golden-yellow slabs of lumber, the real giant thoroughbreds of the lumber world, start coming out of the mill, you know the reason for the change in the men. Even for the layman, the sight of those gargantuan pieces of lumber is thrilling. You know you've just seen the champion.

One of these big sticks will contain 2091 board feet—the 112-foot size—and it may come from a log with as much as 9000 board feet of lumber in it. The side-cut goes into other lumber and timbers. Cutting the stick is a tedious and exacting task, probably another reason why Westport is now the only sawmill in the world willing and able to undertake the job, which requires peculiar crew skill and great care in manufacture.

Among the variety of boats built on these solid Douglas fir keels are Army tugs requiring timbers 76 feet long, 18 x 24 inches in size; minesweepers built on 110-foot keels and with an over-all length when completed of 135 feet; Navy tuna clipper ships using 126-foot keels; and one Puget Sound shipyard is making fishing boats for the Navy built on 100-foot solid keels; freight and passenger ships for Army have been made on 140-foot keels made up of two spliced timbers, and the boats finish out at 150 feet.

One order of long timbers for a Coast shipyard required 240 logs from 94 to 118 feet in length.

Giving the Navy the big stick was just one of many important war jobs undertaken by the West Coast Douglas fir industry during the war, and because this region is the only place in the United States where the shipbuilding industry can get long timbers, the mills able to get out big stuff have been working two shifts since before Pearl Harbor.

When the Navy started building warships, heavy battle cruisers and carriers, both auxiliary and those of the largest class, a shortage developed in decking for these craft, since teakwood, used for almost a century as deck covering for battle wagons, was no longer obtainable. A check of available domestic woods developed Douglas fir as the wood most likely to succeed in this important war job, so to every West Coast mill that could cut decking up to 40 feet in length went out rush orders. Cutting decking lumber to the Navy's specifications is not exactly classed as one of the easier jobs around a sawmill; in fact, only one other item in the war was as difficult to obtain, and that was aircraft grade lumber.

Keel sticks are sold on standard grades, but are essentially select structural in character. One of the largest class of ships being built with these Douglas fir sticks for keels is the Navy minesweeper. About 800 of these craft have been constructed, with over-all lengths up to 135 feet, and they are built on a solid, one-piece keel 110 feet long.



Loading big sticks.

Precision Repair Parts for Diesel Engines



Diesel engine wrist pin; cams, tappet and lubricator pump parts.



Fuel injector tips and needle valve parts for various diesels.



Diesel engine fuel pump and plunger assembly.

The repair of the fuel injection system of the modern diesel engine, with its precision ground and lapped plunger type fuel pumps, requires the services of highly skilled and experienced men. These pumps must hold from 2000 to 5000 pounds pressure and be capable of injecting a continuous supply of fuel to the spray or atomizer tips, which have from six to eight holes, each of .006 to .008 of an inch in diameter, drilled in their ends. These parts cannot be made in an ordinary machine shop.

In 1930 Walter Atkinson, an engineer with many years of experience in such work, saw the opportunity and necessity for a shop in the San Francisco Bay Area which would specialize in manufacturing diesel engine fuel injection parts. Since that time the Atkinson Grinding and Machine Works of 1137 - 32nd Street, Oakland, California, has made parts for diesel engines of all types of foreign and domestic manufacture, either from sample parts or blueprints.

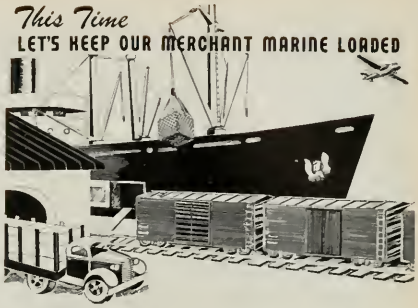
The plant is especially equipped to do machining, heat treating, grinding and lapping of all parts, including nitriding of parts made from Nitralloy steel.

Among the U. S. companies for which the company manufactures parts are: The Atlas Imperial Diesel Engine Company, the Enterprise Engine & Foundry Company, the Union Diesel Engine Company and the Lorimer Diesel Engine Company.

The shop superintendent is Andy Gianotti, who has been in the diesel repair field since 1924.

Pacific WORLD TRADE

By T. Douglas MacMullen



Harbor Cities, Wake Up!

The Air Lines Will Get You

The geographic position of our coastal cities is a responsibility, but it seems to rest very lightly on the shoulders of those charged with preserving the merchant marine, foreign trade, and the very cities themselves. Transportation, vital to everyone, becomes just a sort of nuisance when new facilities are needed. But something new, like an airline, captures the public fancy for a while.

Complacency is the very pleasant consciousness that all is well. Like so many things that men manage, there is danger in a future that is merely based on past success. Success breeds content, content breeds apathy, apathy breeds decay. We must fight for our cities, our ports, our shipping, for the welfare of all is involved.

New people and new industries that know little of what their inheritance has cost are setting an ever-faster pace, while port facilities seem as unchangeable as the mountains. (In some cases this may be so.)

Our ports are the gateways on the paths of world supply. Airlines will not replace them, but may weaken them.

That overseas air services are important is an obvious truth. They will speed up many types of traffic and will create new types. But when they are operated solely in the interests of the airlines they are likely to destroy far more than they create. Port cities and the vast regions they serve are far more vital to the country than all the commercial airlines.

To many people—even those who are otherwise well informed—air competition with steamship lines does not seem serious, taking only the top passenger traffic and a few light packages and mail. But there are steamship companies that cannot survive without their passenger traffic, and their freight trade routes will be left high and dry.

To many cities and their Chambers of Commerce, the airlines are a glamorous new love, demanding full attention, while their ports decay. They choose to overlook the fact that they live off their harbor business, their insurance, their trade financing, and that an important part of every dollar they have comes from shipping. And their back-country, clear across to the other shore, needs the port facilities and markets for the products of factory and farm. Twenty-six per cent of all farm crops is exported.

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Now the ports are in danger. Through a trick interpretation of the Civil Aeronautics Act, steamship companies are being deprived of the opportunity for providing air service to supplement their surface lines, **and the air terminals are moving inland.** For instance, the Examiner for the Civil Aeronautics Board recommends that Asiatic air service from Manila through Hong Kong, Shanghai and Japan follow the great circle course down through Alaska and Canada to Chicago or St. Paul, completely by-passing the Pacific Northwest states and ports. The Northwest airlines would move their terminals from Seattle to Chicago.

On the European run, the planes will come down through Canada to Chicago, Detroit and Washington, by-passing New York, Boston and Philadelphia.

On the Pacific, the Matson Navigation Company is anxious to provide the finest type of air service to Se-

(Continued on page 538)

"The Road to Victory has been Paved with Water."

—Basil Harris, President U. S. Lines Co.

Power Plants Needed Abroad

By E. A. Arnold

Manager, Export Sales Department
Joshua Hendy Iron Works

Among the major problems of rehabilitating a war-torn world is that of providing electric power in areas where all power-producing machinery has been smashed, blown apart, or carried away. Immediate replacement is almost impossible, for the factories that would build such machinery have suffered a like fate, or are in the slow process of turning from war to peacetime goods, with their normal capacity sadly impaired.

For instance, the great Russian land areas occupied for a time by the Germans suffered almost complete devastation. Powerhouses, dams, factories, mines, and cities lie in rubble, and rebuilding of them has in many cases not even started. Electricity is lacking, and means for supplying it in adequate quantities are non-existent. But packages of power are already on their way to supply electricity that is the life-blood of a modern industrial civilization. Lights will gleam again in darkened areas; factories will hum once more, turning out the essentials to human life and comfort; and long-inactive public utilities will resume their service to mankind.



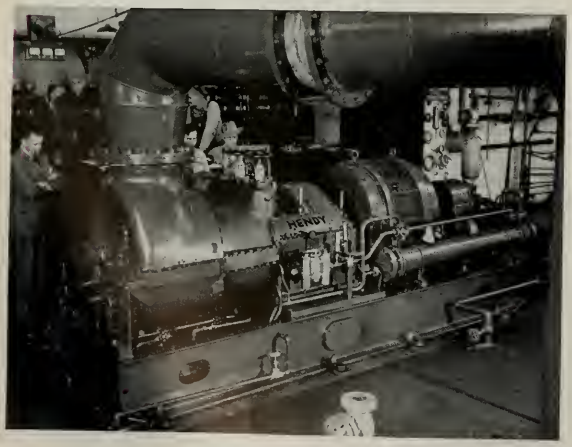
E. A. Arnold

"Package power plants" of the land-turbine type are, in the practical sense, a direct outgrowth of World War II. The initial units were designed to be transported over the Burma Road into China in individual pieces not more than 20 feet long or five tons in weight. Armies of the world have contributed to the package design as a result of their need for mobile power units in the field. The result is a power plant of which they have every reason to be proud and for which the Russians should have every reason to be thankful.

A good example is the line which the Joshua Hendy Iron Works has been furnishing. Built in 500- and 2000-kilowatt sizes, the turbo-generator sets are assembled at the plant and transported as integral units, complete with spare parts, to their installation points. Equipped with skid-type bedplates, they can be transported with ease, or even dragged into position by tractors. Within approximately 36 hours after their arrival, they can be assembled with boilers and other component parts, and start operation. They are designed to operate under the most primitive conditions, using low-grade lignite coal or peat for fuel. If that is not available, wood cut from the forests will do. With such plants in operation, the building of permanent installations is speeded many times, and when a permanent plant is complete, the mobile unit can be moved with ease to the next location where it is needed. Thus a single packaged land turbine may facilitate the reconstruction of a huge area, appearing successively at many points.

In proportion to the service they perform, the Hendy-built sets are not large. The 2000-kw units are approximately 21 feet in length; the 500-kw sets 15 feet. Yet 500 kilowatts will care easily for the power needs of a town of more than 5000 persons, and a community of 25,000 can get

500-kw turbo-generator on test stand, with C. G. Cox, Hendy special-projects sales manager, at left. Plant is building 41 of these units for Soviet.

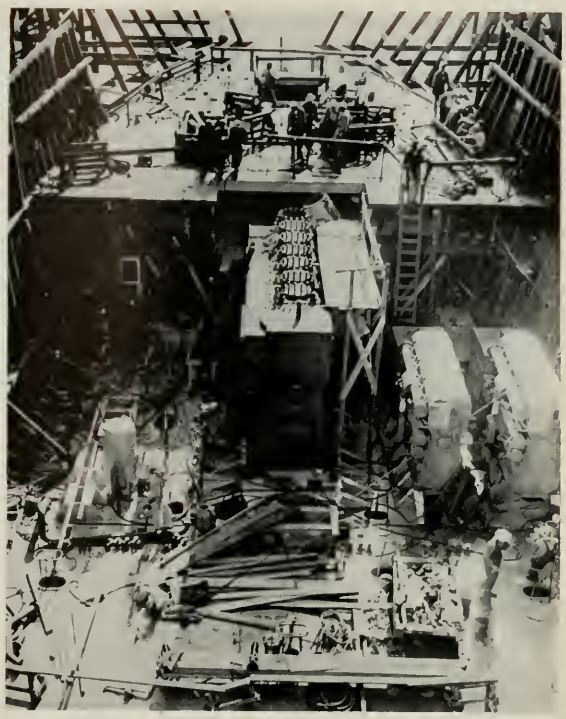


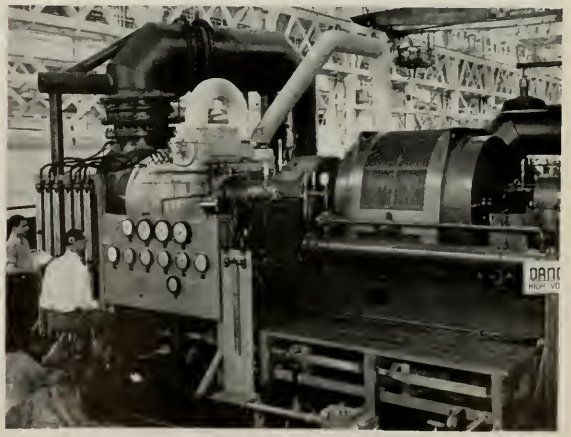
lequate current from 2000 kilowatts. he entire Hendy plant, with its tre- endous power requirements for nderous machinery, laboratories, st stands, X-rays, offices, and light- g requires only 4750 kilowatts for ll operation.

In addition to the 500- and 2000- v sets the company is now manu- cturing for the Soviet, it has re- ived inquiries from China, India, ustralia, the Dutch East Indies, exico, and many countries in South d Central America, as well as from urope, North Africa, and the Le- nt, a large part of them with de- iled specifications as a basis for acing of bids. Great electrification ograms are planned for various rts of the world, and land turbines n provide quick, economical power r this purpose. The steam turbine eds no massive dams or hydro- ectric plants, no miles of copper bles, no permanent steel-and-con- ete installation. It can even be ounted on a railway car and travel om place to place.

Hendy standards of engineering sign and workmanship are creating international reputation for the g West Coast plant, a reputation hich is growing with every unit de- ered. That is an important thing w, and it will be more important hen, at long last, we regain the essing of universal peace. Plans of e United Nations Relief and Re- bilitation Authority call for the de utilization of turbine-generated wer for central stations, rivers, rbors, dams, transport, mines, and types of communications, and in- iries indicate that industrial appli- ions will be substantially increased, rticularly in units with capacities from 200 to 10,000 kw. Turbine- wered dredges, harbor cranes, re- eries, and manufacturing plants being planned in unprecedented antities all over the world, not ly as a part of recovery from the nage of war, but as new and wide- read development programs.

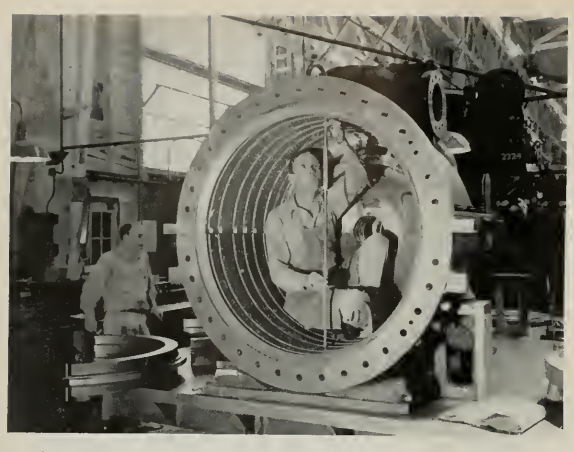
China in particular, working in njunction with the UNRRA, has gineers detailed to a variety of ojects for development of natural





Top of page: Maritime C1-M-AV1 cargo ship, showing installation of two 250-kw Hendy auxiliary diesel-generator sets in relation to main Nordberg engine.

Bottom: 2000 kw package-type turbo-generatotr, one of 10 being manufactured by Hendy for Soviet. Gages and other equipment are used in testing.



Inspector gaging internal dimensions of rateau diaphragm grooves in cylinder for 2000-kw turbo-alternator, manufactured for Soviet.

resources, including water conservation, river and harbor improvement, electrification, and industrial expansion. Taking a leading part in these programs is the China-America Council, of which Hendy is a member. Similar programs are under way in other countries, notably Brazil and Mexico.

While there is also an upswing in the demand for diesel power, also provided by Hendy, the growing demands for turbines are particularly impressive, especially in applications where electricity has been provided by other types of machinery. Development of this trend has an important bearing on the West Coast, long known for its production of reliable diesel engines, now that the manufacture of turbines has established that industry in the Western half of the United States.

Education in China Will Help Trade

By M. L. Paulsan
Chinese News Service

War-torn China is preparing for peace and prosperity. In a land of 500,000,000 people who have had their homes bombed and burned, who have been uprooted from their native land and who have been fighting a ruthless enemy for eight long years, China's task is not easy. But China is a vast country filled with natural resources. She has things other countries need, and once her innate wealth is harnessed she can throw open her markets for the world to buy. In return, China will buy from her global neighbors, and 500,000,000 people will constitute her buying power.

China knows her problem. It is to educate her people.

In the short period between the time the National Government came into power and the time the Japanese launched their all-out attack, China's educational system took a number of important steps forward. With the advent of war, progress was momentarily stopped. Then strange and miraculous things began to take place. Despite the fact that whole universities were bombed out, that teachers were needed for immediate war work, that students were forced to flee from their homes and that textbooks were almost impossible to get, China today has a total enrollment of 17,712,292 students, a considerable increase over pre-war figures. There are 145 colleges, universities and technical schools, about 30 per cent more than before the war.

In the winter of 1937, when Shanghai had fallen and the National Government was moving west, the dislocation of education resulting from the enemy's deliberate bombing and destruction of schools seemed a certainty. Schools were moved inland. A service corps to absorb refugee teachers was organized. Nationally operated middle schools for the care of refugee students were established.

The widespread hostilities also resulted in upheavals and changes in the social economy of the country and let down barriers against the under-privileged classes of people. In 1938 a people's education program was launched. As a result, nearly 30 per cent of the nation's 360,000,000 illiterates in the 19 interior provinces have already learned to read and write.

With higher remuneration than in pre-war days, farmers and laborers are now able to send their children to schools. The government too has directly aided refugee students who received no financial aid from their families by granting scholarships and loans. This newly adopted system has brought education to tens of thousands of poor and deserving youths, who, in pre-war days, would have found education—particularly a college education—forbidden fruit to them.

China has done an amazing job under the worst possible circumstances. She realizes that there is much to be learned, particularly in modern science and industry, from her western allies.

For nearly 75 years China has been sending students abroad for scientific training. In the last two decades before 1937 as many as 1000 students a year, either self-supporting or government-supported, put out to foreign ports to learn and bring back valuable knowledge. Then war broke

Pacific World Trade

ut and the number of students who ould be spared to go to other coun- ries necessarily had to be limited.

But, after six years of fighting, China foresaw the need for multi- udes of experts and technicians for econstruction work when the war nded. Dr. Chu Chia-hwa, Chinese Minister of Education, estimates that ,500,000 engineers, doctors, and ther specialists will be needed. This s far beyond the capacity of the xisting schools and colleges to pro- ride.

The Government drew up a plan equiring a higher educational quali- ication for the students seeking to go abroad. Prior to 1943 privately- supported students were not required o take examinations. The natural esult was that children of wealthy amilies, regardless of their charac- er and scholastic attainments, flocked broad to study.

According to the new plan onlv graduates from recognized institu- ions of higher learning who have done research or actual work for over wo years with creditable result are qualified to apply for permission to go to foreign countries for further education, and all students who in- end to go abroad must pass a cer- ain examination held especially for hem by the government.

Thus for the first time in Chinese history, an examination was held in December, 1943, in Chungking for students who were preparing to study abroad with their private means. Altogether 827 passed. Among them were 35 women. Of the total number, approximately one- third specialized in engineering. Un der this newly established system Chinese students going abroad will be better prepared in language, able to learn what China actually needs, and equipped to use their knowledge in adaptation to China's conditions.

And the Chinese Government also arranged to send and support ex- perts, technicians and 2000 students to the United States, Great Britain and Canada for the purpose of ob- serving, training, and advanced study. Some have already begun to arrive in the United States. More than three-fifths of the 2000 will be sent to the United States, including 1200 agricultural, industrial and mining technicians to be supported by Lend- Lease funds. The rest will go to Great Britain and Canada. The list of specialized fields of training in which these people will be distrib- uted is long, but worth looking over. It shows how carefully China has studied her problem and with what detail she is working it out. The list:

Agriculture, Soil Fertilizer, Plant Pathology, Animal Husbandry, Fish- ery, Agricultural Extension, Hydrau- lic Engineering Architecture, Sani- tary Engineering, Machinery, Farm- ing Implements, Shipbuilding, Tele - Communications Engineering, Electric Power, Radio Manufacturing and Repairing, Motion Picture Pho- tography, Chemical Engineering, Daily Necessities Manufacture, Print- ing, Biological Products, Sanitary Chemistry, Metallurgy, Mining and Industrial Administration, Agricul- tural Meteorology, Aviation Meteor- ology, Horticulture, Plant Bacteriol- ogy, Forestry, Veterinary, Agricul- tural Economics, Civil Engineering, Mechanical Engineering, Science Laboratory Apparatus Manufacture, Aeronautical Engineering, Textile In- dustry, Electrical Appliances, Oil Re- fining, Pharmaceutical Chemistry, Pharmacology, Mining, Communica- tions Administration, Oceanic Mete- orology, Military Meteorology.

Successful candidates, either for observation or practical training, re- ceive an expense allowance plus sal- aries and allowances from the organi- zations they have served. The period for observation is one year, that for practice two years. Arrangements with the American Government for training and practice have been made by the Ministry of Communications, which sent a similar group of men abroad last year.

Numerous scholarships as well have been offered by both England and the United States. For instance, the British Council,* which offered 10 research scholarships to Chinese students in 1942, offered 60 more scholarships in 1944, and several American universities offered more than 30 research assistanceships to Chinese engineers, not mentioning the many scholarships American uni- versities offered to individual Chi- nese. All these scholarships China has accepted with gratitude, and can- didates are selected by competitive examinations. Students who pass will be able to pursue advanced study in engineering, science, medicine, agri- culture, English literature, econom- ics, history, international law, consti- tution, philosophy and music.

*The British Council was established to pro- mote a wider knowledge of the English language and British culture in 1934, and incorporated in 1940. Parliament each year grants funds to support it, and while it has some other sources of income it is primarily maintained by the British Government.

At present there are between one and two thousand Chinese students registered in American colleges, uni- versities, and technical schools, or taking practical training in the Amer- ican industries. These students are from three groups: those with private support, those with government sup- port and those that are here on schol- arships from U. S. schools. Most of the students are between 18 and 35 years of age.

The students here for practical training learn from American indus- try to prepare themselves for future services in China and at the same time do their bit on the production front in the United States.

In the automotive industry, rubber industry, machine-tooling and other defense industries there are about 140 Chinese students in training, who were helping to produce tires, tanks, chain-tools and other useful equipment for the fighting fronts. Chinese students are working in the shipyards on the East and West Coasts as well as in railroad and other transportation systems.

There are about 100 Chinese stu- dents connected with the American organizations in the fields of Social Science, Pharmacy, Nutrition, Agri- culture, Insecticides, Banking, Edu- cation, Mining, Library Work, Pub- lic Administration, Hotels, and Re- ligious Services.

Despite the difficulties of transpor- tation during the war, approximately 140 students who have completed their training have already returned to China during the past year, and as transportation facilities improve, more students will be able to return to their native land and take a direct part in the gigantic reconstruction program China has planned to keep the peace.

Australian Import Restrictions Eased

Relaxation of import licensing re- strictions on a further list of goods from countries in the sterling and non-sterling group were announced recently by Trade and Customs Min- ister Senator Richard Keane.

Goods which may be freely im- ported now include: aluminum and enamel kitchenware, cutlery, vacuum cleaners, hot water and milk jugs, coffee pots, soup bowls, tea strainers and infusers, manufactured tobacco and cigarettes, paint, varnishes and kalsomine, printing, match - making and rubber processing machinery, gramophone needles and men's suits.

Port Facilities Must Keep Pace



Basil Harris

By Basil Harris
President, United States Lines

In all the discussion concerning the future of the American merchant marine there is one factor which is very frequently ignored. That is the outmoded port facilities of this country. The ships that ply the post-war seas will be much faster than the ships before the war. Before this conflict started the average speed of a cargo ship was about ten or ten and a half knots. After the war the speed of a cargo ship will be about fifteen knots. What good will it be for our ships to go speeding across the oceans and then be laid up in port because of inadequate loading and unloading facilities?

The ports of Europe and many ports in other parts of the world have suffered severe destruction in this war. That very devastation of war may prove an ironic advantage for the future for those foreign ports and an equally ironic disadvantage for American ports unless something is done. When the ports of the foreign nations are rebuilt—and they will be rebuilt—you can be certain that they will be constructed in accordance with the most modern and efficient planning.

The ports of the United States, on the other hand, may become further antiquated with each passing year and thus constitute an increasing bottleneck for American foreign trade and shipping.

American port facilities must be modernized in order to keep pace with our faster ships at sea. We must give thought now to the launching of a program that will bring American ports to a par with our ships. I have proposed, and I renew that proposal, that as soon as possible this country embark upon a ten billion dollar program for modernization of American port facilities. It is estimated that it will take two billion dollars alone to bring my home port of New York up to what it should be. All the other ports of the United States are in a somewhat comparable position. This great project, however, is essential for the future welfare of the country as a whole. It constitutes a thoroughly sound portion of any post-war Public Works plan. A ten billion dollar port modernization program will be self-liquidating and it will give thousands of jobs to those who construct the new facilities and those who provide the material for them. Port modernization is a Number One requirement for the early future.

This program must not become a center of rivalry between American ports. Instead it must become a rallying point of unity among all the port cities of the United States. In that way the desired results can be obtained and the entire shipping industry receive the benefits.

The statements of Basil Harris quoted above probably apply to every port in the United States. Cities and port authorities have taken their ports for granted for so long that modernization will be a major undertaking and a necessary one.

The War and Competition Will Force Improvements

It is unfortunate that the harbor facilities of our great cities are so large and costly that they cannot be moved about or abandoned as the cities grow. Hence they are too often inconveniently located in relation to city transportation, and the piers, especially those used for passenger traffic, present a problem that must be solved if the steamship lines are to maintain their volume of top class passenger business in competition with the airlines. Most passenger piers have only crude facilities for handling crowds of people who are either arriving or departing by steamer.

It is suggested that every passenger pier provide waiting-room facilities that will at least compare with those of the modern railroad station. They should be permanent and well furnished, with every modern convenience, and they should be recognized as a sufficiently important adjunct to the city life to justify entirely adequate street transportation to the center of town. The airlines are doing this and they are going to make strenuous efforts to capture the overseas tourist trade. A competitive feature which the airlines will offer will be **inland** port facilities and if this trend develops to a marked degree, the cities will suffer far more than most steamship companies. The steamship companies and civic groups can afford to go to very great lengths in convincing the public that almost every dollar of city money is affected by its port business.



Stiff-leg crane mounted on pier.
(Official U. S. Signal Corps Photo)

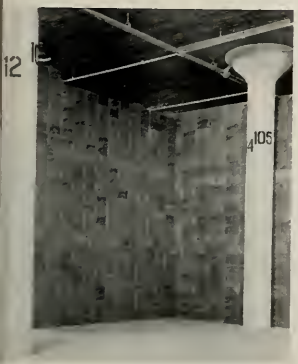


Modern conveyor system for handling uniform cargo.



The old and slow way of handling small units

A beautiful stack of cartons in pier shed, which must be handled again in loading ship.



Freight Traffic

There are few piers on any waterfront that have been built since the advent of the motor truck and the truck now carries from 70 to 90% of the freight to and from the ships. When new piers are built, or when old ones are rebuilt, they should provide two- or three-way approaches for trucks so that vehicles at the outer ends of piers will not be hemmed in by later arrivals and there should be elevated loading platforms for both truck and freight car.

The problem of freight on the piers is involved with labor regulations and those who have the permanent interest of their harbors in mind should make it possible for the expeditious handling of cargo.

During the war the Army developed many procedures for fast loading of ships and it is suggested that all concerned make a study of the Army's methods. It is recognized, of course, that wartime shipping made certain methods possible which might be difficult of duplication in peacetime commercial operations. For instance, the Ports of Embarkation maintain motor truck pools and assign appropriate types of trucks for each kind of freight. With dozens or hundreds of private truck lines serving the waterfront, such a plan would be difficult but might have some possibilities.

Harbor cranes of several types have added greatly to simplifying loading and probably more use will

High-reaching fork lift truck, which, with pallet loading, has saved upwards of 80 per cent in time in handling Army cargo.



Fork-lift truck handling barrels.





A good example of wasted time.

be made of them in the future. In the Army's biggest Port of Embarkation in San Francisco and Oakland many of the docks are equipped with 30-ton capacity gantry cranes, steel stiff-leg derricks with 100-ton capacity, and portal cranes to run the length of the pier straddling freight trains.

Derrick barges, with booms up to 125 feet in length and lifting up to 100 tons are also used by the Army to load deck cargo on certain ships not permitted to tie up at docks and which must anchor in the bay. The barges have also been used at docks, mooring on the off shore side of a ship and lowering their long booms across the vessel's deck to pick up loads from the dock.

Perhaps the greatest single advance in freight handling during the war has been the increased use of pallets for loading great quantities of moderately sized packages such as cartons of canned goods. This method has become so popular that many products are loaded on pallets in the factories and the pallets are left with the goods in freight car, truck and ship. The Army estimates that with certain commodities as much as 80% has been saved in the time required for loading. It is also the practice to ship knocked-down pallets for use in discharging certain types of products previously packed in bulk.

The fork-lift truck has been made so flexible that it can be used for most types of cargo and is sure to have a great future wherever freight is handled.

The above are just suggestive of methods that can be devised when the mind is put to it. If the future prosperity of the shipping industry is at stake, there should be more minds set to work.

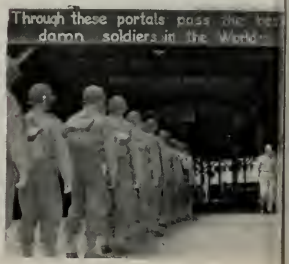
One of the giant overhead cranes operating along the piers at the Transportation Corps' San Francisco Port of Embarkation lifts a P-T boat from a flat car and moves it to the ship on which it is to be loaded for overseas transportation. Photograph taken in 1943.
(Official U. S. Signal Corps Photo)



Airports

The aircraft industry is going to very great lengths in developing improved methods for handling both passengers and cargo and the results are being widely publicized. The fact of the great number of inland cities that have been declared ports of entry by the Treasury Department indicates the importance of air imports. The airlines in 1944 carried over 200,000,000 pounds of mail, express, and excess baggage and will approach the billion mark with planes now on order. Airplanes are loaded by company employees who are constantly devising time-saving methods, including conveyor systems, and adapting many of the methods used by the Army. Harbor management will have to find ways of competing with these developments and of getting municipal support, for inland cities as well as harbor cities are cooperating with the airlines. Even Chambers of Commerce whose existence depends upon the harbors are setting up departments and experts to aid the airlines in developing traffic volume.

Basil Harris's warning comes none too soon and should be heeded.



U. S. Filipinos Plan Reconstruction

By E. Llamas Rosario
Executive Secretary
Philippine Chamber of Commerce of America

The war has given the Filipinos in the United States, Alaska and the Territory of Hawaii a great opportunity for business leadership. Destruction in the Philippines such as the people have never seen in their history has emboldened the Filipino businessmen abroad to take that role.

The clearest indication that the Filipino businessmen abroad have taken up this role as a challenge is revealed by their diversified plans for business in the Philippines. Wherever there are Filipino businessmen in a community, one finds them planning for economic reconstruction and to gain an economic foothold in the Philippines.

Hundreds and hundreds of Filipinos working in defense industries throughout the United States, and those who are in business privately or with some groups, fully realize that organizing among themselves is the first step toward reconstruction. To this end, the Philippine Chamber of Commerce of America was formed a few months ago in a convention held under the auspices of the Filipino Inter-Community Organization of the Western States. Attendance at this convention was composed of delegates from member communities of the FICOWS, who came from far Alaska in the north to Arizona in the south.

In spite of the many years Filipino businessmen have been residing abroad, this is the first time in their history that they have organized themselves nationally into a chamber of commerce. At the suggestion of Dr. Urbano A. Zafra, economic adviser to the President of the Philippines, the Philippine Chamber of Commerce of America is now preparing a directory of Filipino businessmen in the United States, Alaska and the Territory of Hawaii.

Before the war Filipinos were outranked by foreigners in practically all kinds of business in the Philippines. In the retail trade, for instance, there were four foreigners to one Filipino retailer.

The retail trade was the largest channel for distribution of manufactured goods, and there is no doubt that it will continue to be so now that peace has come. The role of retail business, therefore, is of great significance.

Control of the retail trade was a national concern before the war. One insistent but unsuccessful solution offered was the nationalization of the retail trade by legislation, allowing only Filipino citizens to engage in this business.

One great difficulty a Filipino businessman encountered in entering the retail business was the existence of the "unholy alliance" between foreign importers and distributors and the foreign retail merchants in the field.

In Manila the principal retailing districts before the war were on Avenida Rizal, Escolta (the Fifth Avenue of Manila) and Calle Rosario. Japanese retailers dominated the Rizal avenue; the Chinese had long monopolized the Rosario street; and the Escolta was lined up with Filipino and foreign retailers.

With the defeat of the Japanese and the taking over of Japanese properties by the Philippine Government, Filipino retailers will have a chance to gain control of the retail trade not only along Avenida Rizal in Manila but throughout the Philippines where Japanese retailers once controlled the business.

Filipino businessmen abroad are conscious of their responsibility in helping in the economic reconstruction of the Philippines. To this end,

OFFICERS OF THE PHILIPPINE CHAMBER OF COMMERCE OF AMERICA

Standing from left to right: E. L. Garcia, member Board of Directors and president, Philippine Trans-Pacific Corporation; E. Llamas Rosario, executive secretary; Antonio R. Cruz, treasurer: Jose de los Reyes, board member and president, Philippine Press Alliance.

Sitting left to right: Andrew C. Escalona, vice president; Antonio A. Gonzales, auditor and president, Filipino Inter-Community Organization of the Western States; Dr. Diosdado M. Yap, chairman of the Board; and D. T. Duga, president.





ROUND TABLE CONFERENCE AT SAN FRANCISCO

Reading from left to right: Dr. Urbano A. Zafra, economic adviser to the President of the Philippines; E. L. Garcia, president of the Philippine Trans-Pacific Corporation; D. T. Duga, president, Philippine Chamber of Commerce of America; E. Llomas Rosario, executive secretary; Delfin F. Cruz, publisher, Philippines Mail; Senator Carlos P. Garcia, member Philippine Delegation to the United Nations Conference on International Organization; and Joe Budhi, board member, Philippine Chamber of Commerce of America.

some are already engaged in the import and export business and are now operating in their own fields. Others have organized themselves and have plans under way; still others are in the planning stage.

In Stockton, reputedly the capital of the Philippines in the United States because of the greatest concentration of Filipinos, a group of businessmen have organized the Philippine Trans-Pacific Corporation, designed for economic reconstruction. With its authorized capital of $1,000,000, the Corporation shall engage in retail trade, real estate, in the development of land, air and water transportation, in the development of agriculture and other industries and in the import and export business.

With these plans of Filipinos abroad for business and reconstruction in the Philippines come the American businessmen as investors, partners or advisers. This business partnership between U. S. Filipinos and Americans is growing steadily in the number of corporations and plans for reconstruction. It is a new kind of business alliance which has come out of the war.

Kenneth H. Campbell, manager, World Trade Department, San Francisco Chamber of Commerce, has been appointed a member of the Philippine Advisory Committee of the Foreign Economic Administration and attended a meeting on August 14 in Washington, D. C., to consider report of the FEA mission to the Philippines.

Mr. Campbell represented West Coast exporters and San Francisco members of the Committee to weigh the report of a recently completed mission to the Philippine Islands in connection with possibilities and methods for resumption of private trade between the United States and the Philippines.

Harbor Cites, Wake Up!

(Continued from page 529)

attle, Portland, San Francisco and Los Angeles, but is thus far refused a certificate because of being a surface carrier. Matson was a pioneer in overseas air promotion, and has set aside $8,000,000 for its air program. But because the CAB is in one breath worried about Matson's competition with its own steamship operations and in the next breath worried about competition with other air lines, no certificate, although Admiral Land reports that 26 foreign steamship companies have received approval from their governments to engage in air transportation.

On the Atlantic, Moore-McCormack is equally willing and able to provide air service to coast cities.

Chambers of Commerce! City Councils! Civic groups of all kinds! A siren call may lead to wrecking your port business, **and your own.** "At lovers' perjuries," says Shakespeare, "Jove laughs." Fight for your steamship companies' interests, **and your own.**

A coordinated service of surface craft and long-range aircraft will be, in effect, a new type of service offering many advantages to the traveler and shipper which neither surface nor air services, operating independently of each other, can provide.

The advantages of both types of service, under single management, have been stated by Admiral Land as including the following:

- Interchange of tickets.
- Interchange of weather reports.
- Interchange of reports on ship and plane positions.
- Communication between units and route, either surface or air.
- Knowledge of trade conditions, tariffs, money exchange, etc.
- Experience in the peculiarities of particular trades and of travel habits which vary from route to route.
- Economies of overhead, such as utilization of the same sales promotion, accounting and general business office personnel.
- Conveniences to the traveler, such as ability to ship automobiles and baggage by surface while traveling by air.
- Sale of "package" tours.

It is estimated that without sea-air-operations, fully one-third of the total passenger traffic potential may never be developed on certain routes.

To coast cities, and especially those on the Pacific, there is an opportunity for a real job in protecting and expanding what we have. We have plenty of energy for some things; let us use some of it in the interest of our shipping. Ghost towns are not new to the West.

Pacific World Trade

U. S. Supreme Court Upholds Coordinated Transportation

Decision in Railroad Case Important to Steamship Companies

On June 18, the United States Supreme Court upheld the Interstate Commerce Commission in its granting certain applications by the Willett Company of Indiana, Inc., which is a wholly owned common carrier by motor, subsidiary of the Pennsylvania Railroad. The subsidiary had applied for certificates of convenience and necessity for seven additional routes extending along the lines of the Pennsylvania Railroad between Fort Wayne, Indiana, and Mackinac, Michigan. The ICC granted the applications for certificates and the case went to the courts. The Special District Court reversed the ICC and the U. S. Supreme Court in a six to three decision reversed the lower court, thus sustaining the ICC's decision. The title of the case was Interstate Commerce Commission et al. vs. Parker et al.

Some excerpts from the majority opinion, delivered by Justice Reed, follow. They seem to be just as applicable to steamer-air service as to rail-truck, if some new feature is added to the local transportation situation:

The Court: "The applications were granted after findings that Willett would render service auxiliary to and supplemental of the Pennsylvania service in the transportation of less-than-carload freight. The services to be rendered on railroad billings and to employ railroad fixed and clerical facilities. . . .

"The disputants, here, do not clash over the power of the Commission to determine the need for a new service or that it will serve the public convenience and necessity. The evidence is ample and uncontradicted that delivery by motor of less-than-carload freight to way stations is a more adequate, efficient and economical method for railroads than by 'peddler' car. They join issue on the Commission's determination as to the carrier which will render that service. Shall it be by railroad through the use of its trucking subsidiary or by the existing common carriers by motor?

"The National Transportation Policy has recently been authoritatively summarized by Congress. The declaration requires administration so as to preserve the inherent advantages of each method of transportation and to promote 'safe, adequate, economical and efficient service.' Such broad generalizations, while well expressing the Congressional purpose, must frequently produce overlapping aims. In such situations, the solution lies in the balancing by the Commission of the public interests in the different types of carriers with due regard to the declared purposes of Congress.

Pacific World Trade

"When Congress directed that the act should be administered to preserve the inherent advantages of each mode of transportation, it is abundantly clear that it was not intended to bar railroads from the operation of off-the-rail motor vehicles . . . **Railroads may, therefore, in appropriate places, operate trucks. . . .**

"Common management of railroad and trucks gave promise of better cooperation than would be obtained by arm's length contracts or agreements. While the evidence shows that there were operating truck lines in the area which individually could serve all the way-stations by securing extensions to their present routes, it also shows that no motor carrier is now in a position to render this complete service. . . .

"Since, however, on adequate evidence the Commission found that the motor service sought was a different character from the existing motor service and not directly competitive or unduly prejudicial to the already certificated motor carriers, we hold that the Commission had statutory authority and administrative discretion to order the certificate to issue. **The public is entitled to the benefits of improved transportation. . . .**

"The Interstate Commerce Act contains no provision by which the Commission may compel non-rail motor carriers to coordinate their road service with rail service or may compel rail carriers to coodinate their service with motor carriers. . . .

". . . It must be expected, however, that the Commission will be as alert to perform its duty in protecting the public in the maintenance of an efficient motor transportation system as it is in protecting that same public in the successful operation of its rail system. The Commission is trusted by Congress to guard against the danger of the development of a transportation monopoly. . . . It has the duty to preserve the inherent advantages of each mode of transportation."

In seeking to coordinate steamer and air service, which the Civil Aeronautics Board has thus far opposed, it would seem that the steamship companies can add a favorable ruling by the Supreme Court to their portfolio of arguments.

New British Consul General At San Francisco

Cyril Kane, career officer of Great Britain, who served in San Francisco for seventeen years in several capacities, has returned as consul-general.

Kane will replace Sir Godfrey Arthur Fisher who, after four years in office as consul-general, is returning to England and announced retirement.

Commodity	Algeria	Argentina	Australia	Bolivia	Brazil	Chile	China	Colombia	Costa Rica	Dominican Republic	Egypt	Honduras	Iran	Mexico	Morocco	New Zealand	Palestine	Paraguay	Peru	Portugal	Salvador	South Africa	Spain	Sweden	Syria	Turkey	Venezuela
AUTOMOBILES, TRUCKS & ACCESSORIES	•	•	•	•	•	•	•	•		•		•	•	•		•		•	•		•		•	•	•	•	•
BUILDING SUPPLIES		•	•	•			•		•	•		•	•				•	•			•			•		•	•	
CHEMICALS		•	•	•	•	•	•				•	•	•				•	•	•		•					•	•	
COAL		•			•						•	•	•			•	•				•					•	•	
COFFEE, TEA & COCOA		•			•															•				•			
DRUGS & COSMETICS		•	•			•				•		•	•								•		•	•			
ELECTRICAL GOODS		•	•	•	•	•	•			•	•	•	•							•	•					•	•
FOOD PRODUCTS—GRAIN		•	•	•						•	•	•	•	•			•		•		•		•				•
HARDWARE		•	•	•	•	•				•	•	•	•				•						•	•	•		
HOUSEHOLD PRODUCTS	•		•		•	•		•		•		•		•		•	•		•								•
HIDES—LEATHER						•		•				•		•		•		•									•
LUMBER				•							•									•			•	•			
MACHINERY & TOOLS	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•				•		•	•			•
MACHINERY (AGRICULTURAL)	•	•	•		•	•		•						•	•	•	•				•	•	•		•		•
METALS		•	•	•	•	•	•	•			•			•							•	•			•	•	•
OILS			•	•			•					•											•	•			
PAPER		•	•	•		•					•	•	•	•									•	•			
PETROLEUM & PRODUCTS		•	•			•	•			•										•					•		
PHOTOGRAPHIC EQUIPMENT		•			•																		•				•
RAILROAD EQUIPMENT		•	•		•		•	•											•								
RUBBER & PRODUCTS		•		•			•				•	•	•	•									•	•		•	•
TEXTILES		•	•	•		•	•	•			•	•	•				•			•			•	•	•	•	•
TOBACCO																									•		
WEARING APPAREL	•		•						•	•						•							•	•			

Anticipated Post-War Demand For U. S. Goods

During 1944 and 1945, Irving Trust Company of New York distributed to its friends interested in foreign trade numerous reports from its banking correspondents abroad relative to anticipated demand for American products after the war.

In most cases reference to commodities required was in general terms, but in many instances mention was made of specific articles. The chart presented herewith indicates those goods which were specially listed.

This is not an all-inclusive list; it is just suggestive of the variety and distribution of prospective business.

Imports from West Coast of South America

An upswing in imports from the west coast of South America is reported by the War Shipping Administration.

During June, 30 vessels were loaded, 13 sailing for Atlantic Coast ports in the United States, nine for Gulf of Mexico ports, two for Pacific Coast, one for Mexico, one for Hawaii and four for Europe. Shipment of manganese ore from Chile was resumed after a lapse of two years.

Ten ships carried nitrates for the United States and six for Mexico, Hawaii and Europe, raising to 899,328 long tons the total of nitrates moved during the last fiscal year. The quota established by the War Production Board, 895,000 long tons, was attained and exceeded for the first time since the war started. The program for Europe and Egypt during the next nitrate season calls for another very heavy movement of nitrates, all of which will be carried in vessels under WSA control.

Eight ships were loaded with coffee, copper and copper ores for the United States. The WPB copper requirements quota was attained, a total of 35,000 tons being imported, virtually equivalent to production in Chile and Peru. Six vessels brought tin, manganese and zinc.

On the west coast of Central America two vessels took on cargoes of coffee and miscellaneous for California ports during June and four were loaded with bananas for New Orleans discharge.



Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

The Gyro-Compass

Maintenance—Part X

Control Panel

Maintenance of the control panel should be as follows:

Keep the panel clean and free from oil and grease.

Keep the circuit breaker contacts clean and bright.

Test the alarm unit every week by turning the alarm switch to the OFF position while the compass is operating. If the buzzer does not sound, check the batteries in the lower part of the alarm unit. The average life of a dry cell is from three to four months. When replacing batteries do not simply replace one battery but replace all three.

Keep 20-ampere fuses in the ship's supply fuse sockets.

Keep a 5-ampere fuse in the repeater circuit fuse socket.

The carbon pile voltage regulator, used to keep the 70-volt DC supply constant, is a simple and rugged piece of apparatus and is carefully tested and adjusted before shipment. It may be necessary at times to adjust the voltage setting; outside of this very little attention need be paid to it. If the regulator does not function properly, first carefully check all connections to be sure they are complete and tight. If the voltage is too high it is probable that the regulator coil circuit is open. This can be checked by holding a wrench or a piece of iron close to the magnet; if there is no strong pull, the circuit is open, or partly open. Do not try to make any adjustments until and unless you are sure all possible causes of the trouble have been eliminated.

Voltage Adjustment

The voltage which the regulator will hold can be changed **only** by changing the position of the ¼" nuts on stud to which the spring is attached, which protrude through the bracket at the left side of the regulator. One of these nuts is used merely as a locknut. To raise the voltage the nuts should be screwed farther up on the stud, while to reduce the voltage they should be screwed farther out on the stud. When setting the voltage which the regulator is to hold, **be sure that the regulator has reached its normal operating temperature and that the supply voltage is approximately normal.** When the coil is cold it tends to regulate to a value lower than normal.

Carbon Pressure Adjustment

If the regulated voltage changes with heavy loads the fault does not lie in either the connections or the generator, or due to subnormal operating temperature. This difficulty may be due to lack of pressure on the carbons, which may be corrected by means of the large knurled nut at the left side of the carbon pile. To adjust the pressure on the carbons be sure that there is no current on the magnet; pull down on armature and screw up on the knurled nut until the spring arm will just barely go back against its stop when the armature is released. Then loosen the adjusting nut one-half turn, which will permit the arm to swing back freely against its stop. Never try to change the voltage setting by adjusting this knurled nut, as this will only result in reducing the range of the regulator.

Dashpot Adjustment

The dashpot is of the inverted air type, with a graphite plunger and an air vent adjustment. This vent should be adjusted so as to overcome any tendency to hunt when the load is light, or when starting. Care should be taken not to close up this vent too much, as this will reduce regulator sensitivity. The dashpot is constant in action, regardless of temperature changes, and its construction is such that it will not become clogged with dust.

Replacement of Carbons

Broken or damaged carbons may be readily replaced by removing one of the porcelain guide rods of the stacks. Care should be taken so as not to add or omit any of the carbon plates.

Amplifier Panel

Except for the "Follow-Up" switch and the "Azimuth Motor" switch, which are used when starting and stopping the master compass, the operation of the amplifier panel is entirely automatic. The only maintenance necessary should be a periodic inspection to guard against the presence of moisture, dirt and oil.

The current through the azimuth motor armature from the amplifier is indicated on the AC ammeter on the amplifier panel, and should be approximately 0.4 ampere. This is not a steady indication, but flutters up and down a few hundredths of an ampere. As the rectifier tubes age, or after they have been used several thousand hours, it will be found that the azimuth motor current has decreased and may be considerably less than 0.4 ampere. This current can be restored to normal by shorting out some of the azimuth motor armature

series resistance R3 on the back of the amplifier panel. If considerable adjustment is necessary, it is recommended that the rectifier tubes be changed.

Motor-Generator

Inspect the commutator and brushes every week. If the brushes slide freely in the holders they will bear upon the commutator with the proper tension. Brushes which have worn down more than 3/8 inch should be replaced.

Sparking, the chief cause of commutator troubles, may be entirely prevented by:

(a) Properly sanding in new brushes, when substituting for old ones, until the bearing surface of the brushes conforms perfectly to the curved surface of the commutator.

(b) Never permitting oil or carbon dust to collect in the vicinity of the brush holders.

(c) Keeping the ship's supply voltage within ten volts of the normal value.

(d) Keeping the commutator surface free from oil, grease and moisture.

(e) Keeping the slots between the commutator bars free from dust or grease.

A dirty commutator should be cleaned with a piece of soft cloth moistened with carbon tetrachloride. Remove all traces of carbon, and polish the commutator, preferably with a fresh piece of cloth moistened with alcohol. This will remove any excess carbon tetrachloride and insure proper drying of the insulation. If necessary, clean the brush holders in the same manner after removing the brushes, making sure that the brushes are replaced properly and that they slide freely in the holders.

A rough commutator should be carefully smoothed with a piece of fine sandpaper while the machine is running. Be sure to remove all copper and carbon dust from the vicinity of the brush holders after this operation. If necessary, clean out the slots between the commutator bars with a sharp piece of hard wood.

The neutral or normal operating position of the brush holders is set at the factory and is clearly marked by a white line across the brush holder support and the brush ring. If the machine is disassembled, care should be taken not to shift the brush holders from their normal marked position. However, should the brush holders be moved from their proper position, the brush ring, to which the brush holders are attached, should be shifted back to its marked position by loosening the clamp screw, moving the ring in the proper direction and tightening the clamp screw.

Lubrication

The ball bearings of the motor-generator are packed with grease and require only an occasional additional application of lubricant through the cups provided at each end of the machine. Keep the cups filled with a good grade of bearing grease (such as supplied in the spare parts box). These cups should be filled before starting the equipment, and the handles turned down slightly. It is only necessary to take up on them about one turn each month thereafter.

Course Recorder

Wind clock springs and roller springs every three days, in the direction indicated by arrows.

Keep the inkwells approximately 3/4 full by adding ink once or twice each week; fill them by means of the dropper provided. These inkwells may be easily slipped out of their holders and filled without disturbing the pens.

A primer bulb is supplied for use in starting the flow of ink through the pens. To prime a pen compress the primer bulb, insert pen point in primer hole and slowly release the bulb, drawing the ink up from the well through the pen. Remove primer and allow the pen to bear on the chart. When both pens have been primed, move the chart up and down under them to be sure that the ink flows freely. Once started, the ink will continue to flow by capillary action.

Do not use any other kind of ink than that originally supplied with the course recorder. When a new bottle of ink is opened use the ink dropper thereafter as a stopper instead of the original cork. If the course recorder is to be out of use for several weeks empty inkwells and clean out pen tubes.

To Clean Pens

Pens on the course recorder may be cleaned by holding the large end up against a hot water faucet, and permitting water under pressure to scour the tube. The pens may be removed from the pen arms by pushing them straight up off their supporting brackets, one at a time. To avoid bending the pen arm or hinge, hold the hinge on the pen arm with the left hand and push up on the pen with the right hand, guiding the pen carefully and using steady pressure. Pens should be cleaned with hot water every month. Should they become clogged so that they cannot be cleaned with hot water, use a bare copper wire .008" in diameter, insert this wire in the tip of the pen and work it back and forth to loosen any foreign matter which may have accumulated in the opening in the pen. After loosening this matter in the pen, the pen should be blown out with the primer.

When replacing the pens on the course recorder they must be pushed down into their brackets from behind, sliding them in tightly so that they are held in place by the hooks at the top.

Oiling

Use the same oil which is used for the Master Compass and oil the motor shaft ball bearings and the moving parts of the pen mechanism sparingly every six months. Places where the course recorder is to be oiled are indicated by red paint. **Don't use too much oil,** as too much oil will drip on the course recorder chart. Oil the clock about once each year, using a good grade of clock oil. Use a fine wire or a tooth pick and apply one drop to each of the pivots on the moving parts of the clock mechanism.

Adjustments

Zone Pen—At the upper end of the zone pen arm is an eccentric stud which can be rotated to adjust the position of the zone pen on the chart. The eccentric shifts the pen arm closer to, or farther away from, the indicator dial cam. It is necessary to loosen a nut beneath the pen arm before the stud can be rotated. Be sure to tighten nut again after adjusting zone pen.

Course Pen

The course pen arm is mounted on the four-wheel trolley by a double slotted plate which permits the pen to be shifted vertically in order to align it with the zone pen, and horizontally in order to align it with the proper degree line on the course recorder chart. Vertical adjustment of this pen can be made by loosening a screw located at

the top of the pen arm; horizontal adjustment can be made by means of an adjustment screw slightly to the left of the screw controlling the vertical adjustment.

Alarm Unit

Electrical supply for the alarm unit buzzer is obtained from three dry cells located in the bottom of the alarm unit. These batteries should be tested every three months, and if any one of them is found to be low all three batteries should be replaced. In any event these batteries should all be replaced every three months.

Gyro-Pilot Control Unit

The bearings in the Control Unit are ball-type shielded bearings having a metal shield to prevent dust and dirt from entering the ball race. They are lubricated when the equipment is assembled and will only require, after each period of service, a few drops of light motor oil as a protection against rust.

Keep the inner and outer surfaces of the follow-up rings clean and bright, using a clean cloth moistened with alcohol. If necessary, a little crocus paper may be used to clean them. After cleaning they should be wiped out with a cloth. Clean the air gaps between the rings frequently by passing a piece of folded paper through the gaps. **Do not disturb the relative setting of the follow-up ring air gaps.** The brushes should always slide freely in their holders and should bear squarely on the ring surface. Trolleys should always turn freely. Apply a little cup grease occasionally to the weather and rudder adjustment lead screws. Put a few drops of oil on the control lever and adjusting knob shafts monthly.

Motor Control Panel

Keep the panel clean and dry. Clean the AC relay contact points as necessary by polishing with a very fine sandpaper, and remove dust after cleaning. Clean the reversing contactors with No. 00 sandpaper, and occasionally oil the contactor hinge pins with a light machine oil. Check contacts for freedom of action at frequent intervals, making sure that armatures move easily.

Dynamotor

Maintain this unit in accordance with best electrical practice. Keep the commutator clean; make sure the brushes are well seated, clean, and free in their holders. Be sure that brush springs have the proper tension. Once each year remove the end plates and wash the bearings thoroughly with gasoline. Replace and add fresh ball bearing grease to the grease inlets in the end frame.

Power Unit

Grease gun fittings are provided at lubrication points in the power unit, and are identified by red circles. Apply grease at these points every few months. Keep the large gear faces well covered with a heavy, fibrous, heat-resistant grease. Keep drive motor clean and dry; do not permit oil or dust to collect inside shell. The sealed bearings on this unit require no lubrication. Examine commutator and brushes at weekly intervals and keep the commutator clean, using carbon tetrachloride as a cleaning agent. Excessive grease may cause the magnetic clutch to slip; remove grease from friction lining by means of gasoline; dry with fuller's earth. The follow-up transmitter bearings are self-lubricated and require no attention.

P. O. E. Rigging Loft

How the San Francisco Port of Embarkation is operating its own rigging loft is one of the most interesting stories to come from the waterfront that is handling the bulk of materiel going to Pacific bases.

Men who have sailed the seven seas, some of whom left home at the age of 13 or 14 to become cabin boys and later captains of old windjammers, now work at benches in the rigging loft on a Fort Mason pier with both men and women of two younger generations who have never been out of sight of land.

In the sail loft, for instance, is W. Simonsen of 1674 Tenth Avenue, San Francisco, who in the early days of his 55 years at sea rounded the Horn ten times. Loss of hearing put him on the beach, and his job at the Port is his first on dry land.

Working beside him is Lodorico Mondani of 764 Bay Street, who made and repaired sails on the four-masted Italia for 30 years.

One member of a team making fenders is Rosauro Santiago of 2000A Bush Street, who was on Bataan when it fell to the Japs. He managed to hide in the mountains and fight with the guerrillas until General MacArthur returned. Then he came to the United States with his Brooklyn-born wife.

Men such as these make up the crew of the rigging loft. They work with canvas and with rope to weave debarkation nets, sturdy lines for abandoning ship, sails for lifeboats, litters for the wounded, and dozens of other shipboard necessities.

The sail loft at the San Francisco Port of Embarkation, showing, left to right, W. Simonsen, Lodarico Mandani, Rosario Guinta and Ferdinand Conrad making litters for the Army Medical Corps.

(Official U. S Signal Corps Photograph)





Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

An Important Correction

The June, 1945, issue of this department gave an erroneous solution to an important marine engineers' practical problem, involving fuel used for different distances at different speeds.

"The Chief's" attention was called to this error by C. E. Hubbard, a retired chief engineer and former port engineer, whose letter, in part, reads as follows:

"Problem: A ship covers 1000 knots at 13 knots speed, consumes 225 tons of fuel. Required, the fuel needed for 2000 knots at 10 knots speed.

"This is an important problem and the operating engineer should understand the derivation of the general equations covering conditions assumed.

"The question is: does the index (exponent) of 3 apply to fuel used per nautical mile? One authority uses the index 2 for speed vs. fuel per mile."

Our thanks and deep appreciation to Mr. Hubbard for quickly catching the error in our solution. We used the index 3. The correct index is 2. Unfortunately, any problems solved using the solution given in the June issue will cause the engineer to come out short on fuel, without enough to reach port, even if he has slowed down to conserve fuel for this purpose.

In discussing this problem with examiners and others, it is now apparent that this is a tricky problem, because while the horsepower and fuel per hour does vary approximately with the cube of the speed (index or exponent of 3) the ship takes more time to cover a nautical mile at a slower speed and the fuel per mile is reduced as the square (exponent 2) of the speed.

The correct solution of this problem follows:

Former conditions

1000 miles
13 knots
225 tons of fuel used

New conditions

2000 miles
10 knots
What fuel will be used?
New total fuel is:

$$225 \times \frac{2000}{1000} \times \left(\frac{10}{13}\right)^2 = 226 \text{ tons}$$

Fuel per nautical mile is proportional to the square of the speed or in this case the new fuel per mile is 100 divided by 169 = .59172 times the former fuel per mile. And having twice the miles to cover we have $2 \times 225 \times .59172 = 266.272$ tons.

Putting it in general terms (algebraic) we have:

s = former speed. S = new speed.
n = former tons fuel. N = new tons of fuel.
d = former distance. D = new distance.

$\frac{n}{d}$ = former tons per mile.

$\frac{N}{D}$ = new tons per mile.

Then:

$$N = \frac{n \quad D \quad S^2}{d \quad s^2}$$

Suppose, as is more likely, it is required to find the new speed at which we must steam to reach port on a limited supply of fuel. We know what the fuel tonnage available is and must find a new speed S. By formulae transposition we have:

$$N = \frac{n \quad D \quad S^2}{d \quad s^2}$$

$$Nds^2 = n \; D \; S^2$$

(Formula to remember: new tons times old distance times old speed squared equals old tons times new distance times new speed squared.)

And:

$$S^2 = \frac{N \; d \; s^2}{n \; D}$$

$$S = \sqrt{\frac{N \; d \; s^2}{n \; D}}$$

Using this formula in a similar problem, suppose our ship made 1000 nautical miles on 225 tons of fuel at 13 knots. We suspect we may be short of fuel and on checking find we have 266.272 tons of useful fuel left. We have 2000 miles to steam to the next port. Can we make it? If not what speed shall we steam in order to make it?

Substituting values, the new speed is:

$$S = \sqrt{\frac{266.272 \times 1000 \times 169}{225 \times 2000}}$$

$$S = \sqrt{100}$$

$$S = 10 \text{ knots}$$

This leaves us no margin for unexpected weather or inaccurate meas-

urements of fuel, distance and speed. It would be well to steam at less than 10 knots, or better use less fuel in the above formula than actually measured, such as 200 tons. If we used 200 for the available fuel our new speed would figure about 8.7 knots and we would have 66 tons of fuel left when we reached port.

There are two approaches to the reasoning of this problem, and explanations of the square ratio for fuel per mile. One, the logic of the relations, and two, by algebraic formula. Both amount to the same thing, for algebra is only logic set down in symbols.

First, let us reason it out. Friction force of the mechanical type, such as dragging a box over the deck, or machine friction in general does not change much with change of speed. If 100 pounds drags a weight along the deck at 10 feet per minute, the same force of 100 lbs. will drag it at 20 feet per minute. The foot pounds per minute are twice as great, therefore the horsepower varies as the speed for this kind of friction. But the friction does not change with speed and the work done per foot does not change so that the Btu liberated per foot of travel remains the same regardless of speed. Therefore, if the same Btu per foot is used, the same fuel will be burned in the engine doing this work per foot of distance regardless of the speed. So at double speed we have to use double the horsepower.

Pure fluid friction such as dragging a wire through water varies about with the speed. If 100 pounds pulls it at 10 feet per minute, 200 pounds will be needed to pull it at 20 feet per minute. This is viscous friction and thus the increase in pull for increase in speed means that the horsepower (product of speed and pull) increases as the square of the speed. If we have double the speed we have four times the horsepower. But we have covered a given distance in half time and 4 times the hp for one half the time is only 2 times the horsepower hours, or Btu delivered. Thus the fuel used per unit distance is proportional to the speed. And double the speed means double the fuel per unit distance for fluid friction.

But a ship or body of displacement being moved through water offers still a third kind of friction, called fluid-load friction, similar to a fan, a blower, or a centrifugal pump. The friction increases as the square of the speed. If 100 lbs. pulls it through the water at 10 feet per minute we need 400 lbs. to pull it at 20 ft. per minute. And at double speed and four times the force we have 8 times the horsepower, or power increases as the cube of the speed for ships.

But at double speed we cover a unit distance in one-half the time and 8 times horsepower for one-half the time is four times the horsepower hours per unit distance and the fuel used is proportional to the square of the speed.

In other words, the heat liberated per unit distance equals the Btu, and thus fuel expended per unit distance varies with the type of friction, as follows: for mechanical friction there is no change, regardless of speed; for pure fluid or viscous friction the fuel per unit distance varies with the speed; to double speed doubles fuel per unit distance. And for fluid-load friction, as in ships, this factor varies with the square of the speed and double speed means four times fuel and heat release per mile.

Let the large letters represent the new conditions and the lower case (small letters) represent the old conditions as follows:

S or s = speed
HP or hp = horsepower
F = fuel rate per horsepower hour
N or n = total fuel used
T or t = time in hours
D or d = distance in miles

And assume (nearly correct) that:

$$\frac{HP}{hp} = \frac{S^3}{s^3} \quad \text{and thus} \quad HP = \frac{hp\ S^3}{s^3}$$

then:

$$N = HP\ F\ T \quad \text{and} \quad n = hp\ F\ t$$

dividing equals by equals:

$$\frac{N}{n} = \frac{HP\ F\ T}{hp\ F\ t}$$

$$= \frac{HP\ T}{hp\ t}$$

substituting for HP

$$\frac{N}{n} = \frac{\frac{hp\ S^3\ T}{s^3}}{hp\ t}$$

$$\frac{N}{n} = \frac{hp\ S^3\ T}{s^3\ hp\ t}$$

$$\frac{N}{n} = \frac{S^3\ T}{s^3\ t}$$

$$\text{but } T = \frac{D}{S} \text{ and } t = \frac{d}{s}$$

substituting

$$\frac{N}{n} = \frac{\frac{S^3\ D}{s}}{\frac{s^3\ d}{s}} = \frac{S^2\ D}{s^2\ d}$$

$$N = \frac{n\ D\ S^2}{d\ s^2}$$

which is the relation desired.

Summarizing briefly: the horsepower required varies as the cube of the speed of a ship very closely and within the range of normal propeller performance. The fuel per nautical mile varies as the square of the speed.

While no excuse is offered for the error in the June issue, it is hoped that this revision and detailed treatment may help settle the many arguments which are regularly coming up over this problem, and impress the minds of engineers with its importance.

Society of Industrial Engineers Formed in Bay Area

A new Society of Industrial Engineers was formed at a meeting held in the Engineering Building of the University of California on August 2. The group is being formed by about 60 industrial engineers of the Bay Area.

President of the Society is Prof. E. P. DeGarmo, Dept. of Engineering, University of California; J. R. Frost, C & H Sugar Company, Crocket, is vice president; J. G. Porteus, Simmons Company, San Francisco, is secretary; and C. R. Considine, Kaiser Cargo, is treasurer.

The purpose of this Society is to contribute to the general advancement of its members through education and exchange of ideas and to educate industry, labor and the general public in the fundamental principles of industrial engineering.

Emergency Water Rations

All emergency food and water rations on lifeboats and life rafts must now be packed in hermetically sealed containers of an approved type. This is in accordance with a ruling of the United States Coast Guard effective November 1, 1944. After 12 months' study, The Chemical Service Company of Baltimore, Md., and San Francisco, Calif., has developed a container which meets Coast Guard requirements and shows outstanding "keeping qualities."

Lifeboat and life raft rations have always offered a serious problem, especially at the beginning of the war, when abandoning ship was a common occurrence. Seamen frequently found their food and water unusable when most vitally needed. The greatest difficulty was in canning water so as to retain its sterility, clearness, freshness and potability. Unlike other beverages—and most food—water corrodes tin cans and thus becomes contaminated.

In preparing its "Unit-Pack" Water Ration, the company designed a specially constructed tin container, internally and externally coated to resist corrosion, and of such structure and strength as to resist damage from freezing, extreme heat, the drop from the side of the ship and other rough handling—"wear and tear" which ordinary tin cans will not withstand. The water is chemically treated to remove excess oxygen, the primary cause of corrosion. Then it is sterilized in processing tanks at 212 degrees F. until no live bacteria is present. Since production began 9 months ago, all the water packed has been found to be completely free of bacteria.

The cans are sterilized by steam at 60 pounds pressure and then washed with hot water. Moving on belt conveyors, they pass under stainless steel fillers, where they are filled to overflowing with water direct from the processing tanks and having a temperature of from 200 to 212 degrees F. The cans tip automatically, leaving a uniform head space. Pre-sterilized lids are then sealed on by automatic closing machines, thus creating within each can a vacuum of from 5 to 7 inches. The vacuum causes the sides to be "paneled" or pulled in slightly; this gives the side wall expansion space within the can and is the most important factor in preventing damage from freezing and shock.

Before being cooled, the cans are inverted and moved along a chain conveyor, further insuring sterility of the lid and headspace. They are stored in the cold for 48 hours and then checked for air leaks and excessive scratches. The paneled walls allow leaking cans to be detected immediately. Finally, the bare side seam of each can is coated automatically with corrosion-resistant pigmented lacquer.

The Chemical Service Company, manufacturer of "Unit-Pack" Emergency Food and Water Rations, reports that production is now at 20,000 cans a day, with further expansion contemplated.

New Line of Bar Shears

A new line of open-end vertical bar shears, designed in 10 sizes and with ram pressures of from 25 to 300 tons, has been announced by Thomas Machine Manufacturing Co., Pittsburgh, Pa. Shearing capacities for rounds range from 1 in. to 3 in.

The open-end feature represents a major improvement over conventional closed-end shears, enabling quicker, more accurate handling and making the shear blades easy to see and change, according to the company.

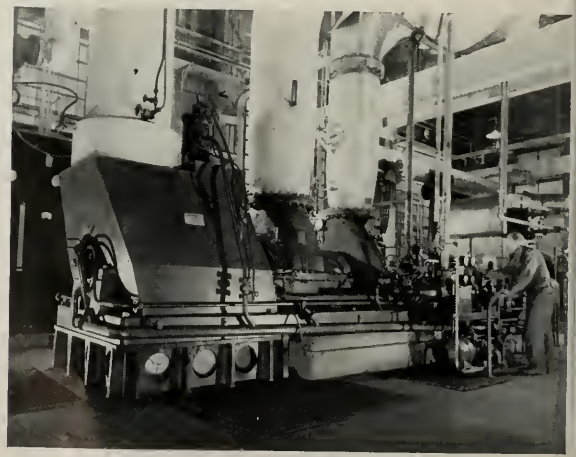
The new shears also have the advantage of being adaptable for punching, and plate and angle shearing. The ram is machined for attaching various types of punching tool arrangements, including single, double or triple-gaged units, cluster punches or floating punch.

Frames of the new machines are constructed of rolled steel plate with heavy steel throat section welded into place. The multiple jaw type clutch has a positive automatic kickout for stopping ram at top of stroke. Flywheel is mounted in roller bearings located within frame for safety and to eliminate overhung load on bearings. A V-belt motor drive provides quiet operation and reduces shock load on the motor.

Gas Turbine in Operation

Illustrated herewith is one of 29 Allis-Chalmers gas turbines now performing successfully in the Houdry process for oil refinery service, this and a companion unit producing 10,255 horsepower in a 100-octane gasoline plant in Ohio. Only land turbine application actually operating, the Houdry gas turbine unit is a forerunner of other important power plant uses in both land and marine fields. Allis-Chalmers already has operating an experimental marine gas turbine designed and built as a part of an extensive development and research program, has announced complete designs for a 90-foot, 4800-horsepower gas-turbine-driven railroad locomotive, and considers the "peak knocker" for electrical power systems quite promising for the not-too-distant future.

Gas turbine in operation.
(Photo courtesy Allis-Chalmers Mfg. Co.)



Hot off the Press

Book 449 of the Stow Manufacturing Co. is just off the press. The book gives the most advanced technical data regarding approved application of flexible shafting on ship board, including coupling terminals for various types of valves, remote station equipment, stuffing boxes, and other features. It serves as a practical manual, covering the preparation of mill length flexible shafting at the shipyard and includes installation and maintenance instructions.

Flexible Shaft Remote Valve operating Gear is being specified for new combat and maritime ships; conversion from old style, rigid controls to the flexible is being carried out on an increasing scale on older vessels and it is anticipated that as soon as conditions permit of more overhauling and modernizing, the advantages of this improved control gear will be extended to many more ships.

"Inspection and Maintenance of First Aid Fire Extinguishers," is the latest practical manual published by Walter Kidde & Company, fire-fighting equipment manufacturers. This 12-page booklet is directed toward the plant foreman or fire chief. It is graphically illustrated with drawings, photographs and charts. A basic maintenance system is outlined, including questions of supervision, record-keeping, and recharging of all types of extinguishers.

General Electric Company has available a 56-page booklet, "Instrument Transformer Accuracy Standards," explaining the ASA accuracy standards for potential and current transformers and how they differ from the NEMA standards. Tables and graphs simplify the use of the book in classifying transformers for accuracy, evaluating the effects of transformer errors on meter readings, and explaining the significance of accuracy classes and burdens.

Marine Diesel Engines, Publication JHA-11, is a new 16-page booklet issued by Joshua Hendy Iron Works. It describes a series of marine diesel engines, six and eight cylinders, with a power range of 350 to 675 hp. Included are exterior and cutaway views, general dimensions chart, specifications and power-rating curves.

"A Little Air Power" is a 24-page, two color catalog, No. 1011, just published by Ingersoll-Rand Company. Mainly photographic with a minimum of text, this book is designed to be a useful assistant for every shop man. It is a virtual clearing house to enable production men to benefit from one another's ideas and to show what is being done with small compressors.

Struthers Wells Corporation has issued Bulletin No. 54-T, descriptive of the ISC Electronic Flame Cutter. The pamphlet explains the operation, construction and specifications of flame cutter.

Agitair Air Filters, is a new bulle-AF-44-1, issued by Air Devices, Inc., describing air conditioning, ventilating, heavy-duty industrial, and grease removal applications. It gives valuable engineering data for Agitair Type P, Premo-Aire heavy duty, and Permo-Aire grease removal filters and filter units, and filter holding frames.

Drayer & Hanson, Inc., have recently issued three new folders. "Beautiful Spasaver," illustrates a space-saving, ceiling-type, cooling unit for refrigerators and cold rooms, and gives performance and construction details. "Wat-R-Miser," describes their evaporative condenser equipped with air filter, and includes several excellent tables and charts. "Strata-Flo" is a booklet descriptive of their cabinet type water cooler. It contains six examples of Strata-Flo applications, excellent tables and useful data for calculating water cooling problems.

C. H. Wheeler Manufacturing Co. have released two folders: Deck Machinery, No. 1244, illustrates automatic tensioning hoist, electric hydraulic deck winch, boat and airplane crane and other deck machinery; and Folder No. 944, Tubejet Vacuum Pumps, shows five types of vacuum pumps, for use ashore and afloat.

"Westinghouse Engineering Highlights" is an unusually attractive 32-page booklet covering with text and photographs generation and distribution of electric power; lighting; aviation; marine; electricity at work; measurement and testing; materials. This publication is presented by Westinghouse Electric Corp.

American K.A.T. Corporation has made available a paper entitled "Internal Feed Water Treatment of Locomotive Boilers," which was part of the proceedings of the Master Boiler Makers' Association. This paper discusses current methods of preventing scale and corrosion. Emphasis is placed on the production of pure steam, prevention of foaming and elmination of excessive blowdown. Theory, application and results of organic all-colloidal treatment and after-treatment are fully discussed.

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On the Ways — SHIPS IN THE MAKING

Ingalls to Build Ships for Brazil

The largest single order for post-war ships was revealed recently with the announcement by **Monro B. Lanier**, president of the Ingalls Shipbuilding Corporation, that his company had been awarded a contract for fourteen 12,000-ton cargo ships for the Brazilian Government, to be delivered in 1946. Representing a total value of $37,000,000, the ships will be of the most modern, streamlined design and will contain numerous features never before included in vessels of this type. They will be operated by Lloyd Brasileiro, steamship operating department of the Merchant Marine Commission of Brazil, from Rio de Janeiro and other ports in Brazil to New Orleans and New York. Design for the ships was made by George G. Sharp, naval architect, acting design agent for Lloyd Brasileiro.

Construction of these ships in the United States for the Brazilian Government was authorized by the United States Maritime Commission, who also approved the awarding of the contract. Other companies which submitted bids were Bethlehem Steel Corporation, Federal Shipbuilding Corporation and the Sun Shipbuilding Corporation.

Each ship will have a displacement under full load of 12,000 tons with a speed of sixteen knots.

U.S.M.C. Contracts Cancelled

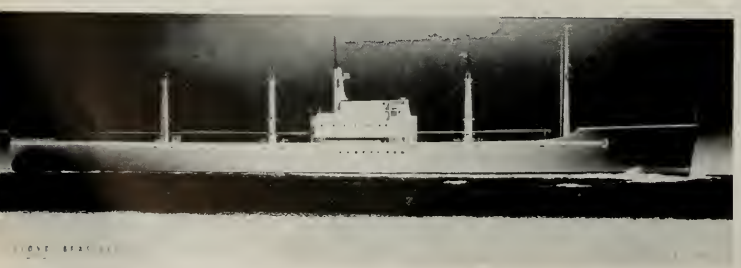
The U. S. Maritime Commission announced August 20 the cancellation of $425,000,000 in contracts covering construction of 135 ships and three contracts for special military equipment.

The contracts canceled covered 35 coastal cargo ships of the C1-M-AV1 type, 42 Victory cargo ships, 24 coastal tankers for Lend-Lease to Great Britain, 4 Libertys being converted to aircraft repair ships, 8 military type Victorys, 8 tankers, 5 military transports of the C4 type, 6 refrigerator ships and 3 of the P2 type.

The three contracts covering special military equipment for the Navy accounts for $70,000,000 of the above total.

A list of the yards and vessels involved follows:

	Yard	No. of Vessels
1.	Lend-Lease Tankers (24)	
	New England Shipbuilding Corp.	12
	Avondale Marine Ways, Inc.	6
	United Concrete Pipe Corp.	6
	Total	24
2.	Military Victory Type	
	Oregon Shipbuilding Corp.	8
3.	Aircraft Repair Ships (Liberty)	
	New England Shipbuilding Corp.	4
4.	Victory Cargo Ships (42)	
	Bethlehem Fairfield Shipyard, Inc.	23
	California Shipbuilding Corp.	10
	Oregon Shipbuilding Corp.	9
	Total	42
5.	Large Tankers (8)	
	Welding Shipyard, Inc. (Norfolk, Va.)	1
	Marinship Corporation	2
	Kaiser (Swan Island)	5
	Total	8
6.	Coastal Cargo (35)	
	J. A. Jones Construction Co. (Brunswick, Ga.)	11
	J. A. Jones Construction Co. (Panama City, Fla.)	6
	Southeastern Shipbuilding Corp.	10
	Pennsylvania Shipyard, Inc. (Beaumont, Texas)	6
	Consolidated Steel Corp. (Los Angeles)	2
	Total	35
7.	C2-Type (Refrigerators)	
	Consolidated Steel (Los Angeles)	6
8.	C4-Type	
	Kaiser (Vancouver Yard) Washington	5
9.	P2-Type	
	Federal Shipbuilding and Drydock Co., Kearny, N. J.	3



The Ingalls Shipbuilding Corporation will build fourteen 12,000-ton cargo vessels for the Brasilian Government at its big yard in Pascagoula, Miss. This drawing, by George G. Sharp, is the first to be released on the streamlined ships which will have refrigerated and air conditioned holds for handling special cargo, as well as other modern improvements.

LIGHTS OF VICTORY

They never dimmed in U. S. Steel's Federal shipyard at Kearny, New Jersey, on the shores of the Hackensack River. Another river, blocked out for nearly six years, has just been lighted — London's famous Thames. It was the night shift at Kearny which helped to turn on the lights of London. Two of the Federal built craft getting set to finish the war are silhouetted in the foreground. The General J. C. Breckinridge (also shown at bottom of page on her way out), 20,000 ton troopship, with streaks of light above caused by moving cranes, and the fast cargo carrier, 12,700 ton Tillie Lykes.



Cut in Consolidated's Contracts

Alden G. Roach, president of Consolidated Steel Corporation, announced on August 20, the extent of war contract cancellations affecting the company's production schedules.

Two AV-1 coastal cargo vessels have been canceled, out of a total of twenty-three yet to be delivered by Consolidated's Wilmington yard; and a contract for sixteen C-2 cargo vessels has been cut to ten. Construction of the remaining twenty-one coastal cargo vessels and ten C-2 cargo vessels will continue into 1946.

Of the fifteen 2200-ton destroyers, being built at Consolidated's Shipyard in Texas, two have been canceled and the yard will continue with the construction of the remaining thirteen destroyers until completion in July, 1946.

Orders for landing craft and Naval Ordnance have been canceled, but these two contracts represent a minor portion of Consolidated's total business, from the standpoint of the amount of money involved, according to Mr. Roach.

Of the 35,000 employees at Consolidated Steel, approximately 1200 have been laid off because of cutbacks.

Consolidated will continue to operate the 14,000-ton drydock recently installed at its Wilmington yard, to handle the ship repairs and expected conversion of ships to peacetime status.

Vessels Now Under Philippine Registry

The United States Maritime Commission has approved the transfer of 16 coastwise vessels to Philippine registry and flag with ownership and direction of their operation remaining under the War Shipping Administration.

The vessels are to be used in interport and inter-island cargo and passenger movements.

Transfer to the Philippine registry was necessary as the Philippine laws do not permit coastwise operation of vessels other than those flying the Philippine flag. In addition, the laws of the United States require that American citizens man vessels under the U. S. flag.

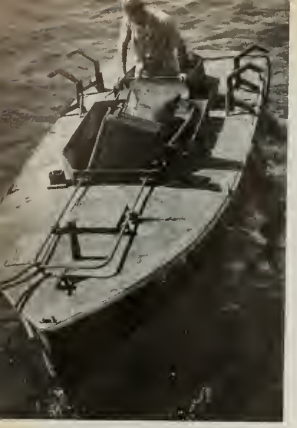
Included in the transfer are two steamships, the SS International and the SS George W. Tucker; the motor ship Masthead Knot; one N3 coastal cargo and 12 small boats.

Commissioned at Marinship

The 32nd of a series of thirty-six 8250 hp turbo-electric tankers named for leading petroleum fields of California, the SS Wheeler Hills sailed away from the construction docks of Marinship Corporation on July 31.

The ship, named for the Wheeler Ridge oilfield located in Kern County, was put through her trial runs and accepted by the Maritime Commission trial board members only 64 days after keel laying.





Commander R. J. Hinnant, commanding officer of the Coast Guard cutter Spencer, examines a Japanese suicide boat captured in the Philippines.

The "Q" Boat

With the major part of the Emperor's fleet littering the bottom of the Pacific from Midway to Tokyo Harbor, the Japanese played with a new suicide weapon—the one-man "Q" boat, the third unit of the Jap team of desperation which included the one-man submarine and the Kamikaze plane.

It is a small, flimsily constructed motor craft built of a thin plywood covering a strong frame, closely resembling the small peace-time pleasure boats seen in all American waters. It is equipped with a steel, forward rack that trips sideracks carrying two depth charges, which are arranged so that they can be set off by a one-man crew. The boat is powered by a six-cylinder engine. Riding low in the water, it is capable of doing approximately 35 miles per hour, top speed.

The "Q" boat would sneak alongside large merchant and naval vessels and explode themselves; and sometimes their targets. Dozens of these craft were destroyed in the occupation of the Philippines.

An attempt by one "Q" boat to reach the Coast Guard Cutter Spencer, during an invasion, was cut short when it came under the guns of an escorting Navy destroyer. Another "Q" boat was captured by an American motor torpedo boat. When turned over to the Spencer, it was converted into a gig for Captain R. J. Hinnant, commanding officer of the Spencer, and his crew.

July Record Low

For the first time since November, 1942, monthly merchant ship deliveries fell below the 100 mark in July with the completion of 97 vessels of 895,185 d.w. tons, the U. S. Maritime Commission announced. In November, 1942, 89 ships of 892,536 d.w. tons were turned out, and from that time until July, the monthly deliveries have been more than 100, the peak being reached in December, 1943, with 219 ships of 2,058,893 d.w. tons.

West Coast shipyards produced nearly half of the ships delivered in July. The 409,843 d.w.t. of the 42 ships built on the West Coast were 45.8 per cent of the total tonnage of 895,185 d.w.t.

Eight of the ships delivered during July were built for military use. Other ships delivered during July included: 30 Victory cargo, two Liberty cargo, 11 C-type cargo, four Liberty colliers, one refrigerated cargo, 27 coastal cargo, 11 standard tankers, and three coastal tankers.

Ships delivered from the nation's shipyards during July follow:

Shipyard	Number	Type
Alabama Dry Dock & Shipbuilding Co.	3	T2 Tankers
Avondale Marine Ways, Inc., Westwego, La.	1	N3 Coastal Cargo
Bethlehem-Fairfield Shipyard, Inc.	8	Victory Cargo
Bethlehem-Alameda Shipyard, Inc.	1	Military Type
Bethlehem-Sparrows Point Shipyard, Inc.	1	C3 Cargo
	1	C5 Cargo
California Shipbuilding Corp.	5	Victory Cargo
Consolidated Steel Corp.	6	C1-M-AV1 Coastal Cargo
Consolidated Steel Corporation, Ltd.	2	C1-M-AV1 Coastal Cargo
Delta Shipbuilding Company, Inc.	4	Liberty Colliers
Froemming Brothers, Inc.	1	C1-M-AV1 Coastal Cargo
Gulf Shipbuilding Corporation, Chickasaw, Ala.	1	C2 Cargo
Ingalls Shipbuilding Corp.	2	C3 Cargo
Ingalls Shipbuilding Corp., Decatur, Ala.	1	N3 Coastal Cargo
J. A. Jones Construction Co., Inc., Brunswick, Ga.	2	C1-M-AV1 Coastal Cargo
J. A. Jones Construction Co., Inc., Panama City, Fla.	2	Liberty Cargo (boxed-plane carrier)
	1	T1 Coastal Tanker
Kaiser Cargo, Inc., Richmond Shipyard No. 4	1	C1-M-AV1 Coastal Cargo
Kaiser Co., Inc., Richmond Shipyard No. 3	1	Military Type
Kaiser Co., Inc., Swan Island Yard	3	T2 Tankers
Kaiser Co., Inc., Vancouver, Wash.	2	Military Type
Leathem D. Smith Shipbuilding Co.	1	C1-M-AV1 Coastal Cargo
Marinship Corp.	1	T2 Tanker
McCloskey & Co., Tampa, Fla.	4	N3 Coastal Cargo
Moore Dry Dock Co.	1	C2 Cargo
	1	R2 Refrigerated Cargo
North Carolina Shipbuilding Co.	3	C2 Cargo
Oregon Shipbuilding Corp.	7	Victory Cargo
Pennsylvania Shipyards, Inc., Beaumont, Texas	3	C1-M-AV1 Coastal Cargo
Permanente Metals Corp., Shipyard No. 1	3	Victory Cargo
Permanente Metals Corp., Shipyard No. 2	7	Victory Cargo
Southeastern Shipbuilding Corp., Savannah, Ga.	1	C1-M-AV1 Coastal Cargo
St. Johns River Shipbuilding Corp.	1	Naval Tanker, Coastal
Sun Shipbuilding & Dry Dock Co.	4	T2 Tanker
	1	C4 Cargo
Todd-Houston Shipbuilding Corp.	2	T1 Coastal Tanker
Walter Butler Shipbuilders, Inc., Duluth, Minn.	3	C1-M-AV1 Coastal Cargo
Walter Butler Shipbuilders, Inc., Superior, Wis.	1	C1-M-AV1 Coastal Cargo
Walsh-Kaiser Co., Inc., Providence, R. I.	3	Military Type
Western Pipe & Steel Co., San Francisco	1	C3 Cargo

RECONVERSION ON THE RIVERS

The first towboat to be launched at Drava Corporation's Neville Island Plant since 1941, was the Keystone which slid down the ways on July 17. The Keystone is 145 ft. x 27 ft. x 11 ft. and is powered by two Diesel engines of 760 h.p. each.



Tug Kadiak

Old timers will be interested to know that the tug Kadiak, built in Alameda in 1896 for the Alaska Packers and operated for nearly forty years, towing their fleet of sailing vessels in Alaskan waters, has been sold by Erik Krag of San Francisco to R. V. Fullenwider of Miranda, California. Her hull will be used for storing and hauling tan bark.

Kadiak performed faithfully for many years and was last employed in tugboat service on the San Francisco Bay, before being laid up at Alameda, only a few hundred yards from her birth ways. In spite of long years of service the hull, 118' by 22' and of 114 tons gross measurement, has been preserved in fine condition.

Forty-Knot Minelayer

Among the vessels completed for the British Navy during the war was the fast minelayer Manxman, which is said to have a speed of 40 knots. Although of only 2650 tons displacement, she is fitted with Parsons geared turbines of 72,000 shp and three-drum type Admiralty boilers. She is distinctive in appearance, having three smoke stacks. There were four of her class, but the others were lost.

South Coast Agent for Kenyon

South Coast Company, Newport Beach, one of Southern California's largest boat yards, has been appointed California representative for the Kenyon Instrument Co., Inc., Huntington, N. Y., according to an announcement by A. T. Newell, president of the latter company.

The California company, headed by Hubbard Howe, will represent the complete Kenyon line of marine and meteorological precision instruments. Dealers who will be appointed by the South Coast Company to handle Kenyon products in the principal marine centers of the California coast, will give Kenyon Instrument complete coverage in the West, Mr. Newell said.

The South Coast Company specializes in small sailing craft, including the Rhodes-33, a fast racing-cruising auxiliary with adequate living accommodations for cruising.

CHRISTENED BY A BILGER'S WIFE

Champagne foams over the bow of the SS Roswell Victory as the ship is christened by Mrs. Ralph W. Decker of San Pedro, wife of president of the Bilge Club and assistant manager of the San Pedro Tow Boat Company. The vessel, named for the city of Roswell, New Mexico, is the 454th ship launched at Calship. Standing behind Mrs. Decker in the photo is her husband, and, at extreme right, James W. Metcalfe, aide to the sponsor.





Launched in War—Operated in Peace

For service in war and peace, the big, 12,600-ton cargo ship, Lipscomb Lykes—built under U. S. Maritime Commission contract for the Lykes Brothers Steamship Company—was launched at Kearny, N. J., on August 12, at U. S. Steel's Federal shipyard.

Named for one of the original Lykes brothers, founders of the line, the vessel was sponsored by Mrs. Ruth Freeman Lykes of Tampa, Florida, wife of John W. Lykes, one of the present generation of brothers.

When completed, the Lipscomb Lykes will be assigned immediately to a Pacific transport job under the War Shipping Administration.



DELIVERED WITHOUT A LOST-TIME ACCIDENT

The Ingalls Shipbuilding Corp. claimed a national record with delivery of the SS Sea Triton without a single lost-time accident. This ship and the Sea Hare, both 18,000-ton all-welded cargo vessels, won the yard a Distinguished Service to Safety certificate and "S" flag.



At left:

A seaman of Uncle Sam's fleet watches as the Marinship tanker Coyote Hills warps into the dock at the shipyard of Marinship Corporation at Sausalito after its launching. She is a T-2 tanker, 523 feet long, with an 8,250 horsepower turbo-electric motor.

Below:

An Aircraft Carrier. New class of CVE's shows USS Puget Sound on successful trial run in waters for which she was named. Built at Todd Pacific Shipyards, Inc., Tacoma division, she is 550 feet long and of 12,000 displacement tons.



Last of War Launchings At Sturgeon Bay

More than 10,000 persons witnessed the double launching of the cargo ship Coastal Liberator and the naval tanker YW 132 at Sturgeon Bay, Wis., August 5, which brought to a close a series of more than 90 ship launchings at the Leathem D. Smith Shipbuilding Company yards.

Speaking at the double ceremonies, Leathem D. Smith, president of the yard, said that although the two ships launched were the last of the war program, "we expect to be launching other vessels here before long."

The yard is bidding on several contracts and is already well under way on the construction of a large quantity of newly designed package freight containers.

Disney-Created Emblem On Tanker Bow

The new Disney-created emblem which represents the men and women of the nationwide ship repair and construction industry received its first public showing at Marinship Friday, August 10, 1945, when the Navy oiler USS Conecuh (named for a river in Alabama) was launched at 4 p. m.

A large replica of the clever emblem, 15′ in diameter, was painted high on the bow of the 523-foot tanker in conformance with the unique custom established at the shipyard of Marinship Corporation at Sausalito, California.

Sponsor of the 90th Marinship vessel was Mrs. Wynn Oeschger, San Francisco, chief operator of the Marinship telephone exchange.

TYPE AND TONNAGE OF MERCHANT VESSELS COMPLETED BY AMERICAN SHIPYARDS FOR THE MARITIME COMMISSION AND PRIVATE INTERESTS—1939 TO JULY 1st, 1945—SELF-PROPELLED, STEEL, 2,000 GROSS TONS AND OVER

Type	Number	Gross Tons	Deadweight Tons	Total Horsepower	Horsepower Turbine	Horsepower Turbo-Electric	Horsepower Reciprocating	Horsepower Diesel
Liberty—Cargo—EC2-S-C1	2,580	18,544,475	27,417,605	6,450,000	—	—	6,450,000	—
Liberty-Aircraft Transpt.-ZEC2-S-C5	20	143,520	193,280	50,000	—	—	50,000	—
Liberty-Collier-EC2-S-AW1	12	79,716	132,300	30,000	—	—	30,000	—
Liberty—Tank Carrier—ZEC2-S-C2	8	57,408	79,140	20,000	—	—	20,000	
British Emergency Cargo Ship	60	430,440	633,600	150,000	—	—	150,000	—
C1-M-AV1 Cargo	119	452,814	593,611	202,300	—	—	—	202,300
R1-M-AV3 Refrigerated Cargo	17	64,618	72,879	28,900	—	—	—	28,900
C1-A Cargo, Diesel Drive	46	246,377	334,382	190,900	—	—	—	190,900
C1-A Cargo, Turbine Drive	19	97,197	140,209	83,600	83,600	—	—	—
C1-B Cargo, Diesel Drive	10	67,664	90,410	41,350	—	—	—	41,350
C1-B Cargo, Turbine Drive	85	571,808	765,823	374,000	374,000	—	—	—
C2 Cargo, Diesel Drive	22	150,176	198,606	146,528	—	—	—	146,528
C2 Cargo, Turbine Drive	217	1,597,267	2,055,609	1,432,200	1,432,200	—	—	—
C2 Cargo-Refrig.-R2-S-BV1	5	30,885	37,635	33,000	33,000	—	—	—
C3 Cargo, Diesel Drive	4	31,544	47,900	35,600	—	—	—	35,600
C3 Cargo/Transport, Turbine Drive	99	805 032	1,195,406	925,650	925,650	—	—	—
C4 Cargo	3	33,060	40,290	29,700	29,700	—	—	—
C4 Transport	43	493,389	328,395	425,700	425,700	—	—	—
Cargo, Waterman Type	24	147,960	258,792	158,400	158,400	—	—	—
Cargo, Export Type	22	152,138	188,504	193,600	193,600	—	—	—
Cargo, Seas Shipping Co. Type	6	42,606	60,237	42,000	42,000	—	—	—
Cargo-Refrig.-United Fruit Co.	3	21,222	18,444	39,600	39,600	—	—	—
Cargo, Private Interests	7	53,474	82,230	61,600	61,600	—	—	—
Cargo, Coastal, Private Interests	1	2,323	4,000	1,300	—	—	—	1,300
Ore Carriers, Great Lakes	21	194,588	334,180	62,000	22,000	—	40,000	—
Cargo, Victory Type, VC2-S-AP2	197	1,498,552	2,101,236	1,300,200	1,300,200	—	—	—
Cargo, Victory Type, VC2-S-AP3	124	943,468	1,322,527	1,159,400	1,159,400	—	—	—
Cargo-Transport, Victory, VC2-S-AP5	113	859,461	1,097,624	1,056,550	1,056,550	—	—	—
Passenger—S. S. America	1	26,454	14,331	37,400	37,400	—	—	—
Passenger—Cargo—Panama R. R. Type	3	30,063	20,436	30,000	30,000	—	—	—
Passenger—Cargo—Mississippi Shipping Type	6	47,859	48,427	51,600	51,600	—	—	—
Passenger—Cargo—C2-S1-A1	3	22,461	19,500	28,050	28,050	—	—	—
Passenger-Cargo, C3, Diesel Drive	4	37,040	39,788	35,000	—	—	—	35,000
Passenger-Cargo, C3, Turbine Drive	14	148,643	121,151	130,900	130,900	—	—	—
Transport—C1-S-AY1	13	92,040	33,066	57,200	57,200	—	—	—
Transport—P1-S2-L2	2	17,400	4,298	17,600	17,600	—	—	—
Transport—C3-S1-A3	2	19,771	14,400	18,700	18,700	—	—	—
Transport—P2, Turbine Drive	11	195,979	103,742	205,700	205,700	—	—	—
Transport—P2, Turbo-Elec. Drive	6	99,284	59,376	123,000	—	123,000	—	—
Transport—S4-SE2-BD1	32	192,000	96,000	211,200	—	211,200	—	—
Transport-Cargo—S4-SE2-BE1	28	169,652	77,700	184,800	—	184,800	—	—
Tanker, Twin Screw—T3-S2-A1	26	306,056	475,622	395,200	395,200	—	—	—
Tanker, T2-SE-A1	438	4,514,721	7,239,145	3,171,120	—	3,171,120	—	—
Tanker, T2-SE-A2	40	423,148	656,056	400,000	—	400,000	—	—
Tanker, T3-S-A1	19	190,616	309,859	146,300	146,300	—	—	—
Tanker, Socony-Vacuum Type	11	110,987	176,578	136,000	136,000	—	—	—
Tanker, T3-S-BF1	3	33,048	54,960	28,050	28,050	—	—	—
Tanker, T3-S-BZ1	3	42,656	70,332	40,200	40,200	—	—	—
Tanker, T3-M-AZ1	1	11,401	17,575	7,500	—	—	—	7,500
Tanker, Liberty Type—Z-ET1-S-C3	62	447,790	655,112	155,000	—	—	155,000	—
Tanker, Private Interests	65	622,755	992,798	438,990	438,990	—	—	—
Tanker, Private Interests	11	112,268	180,679	66,800	—	—	—	66,800
Tanker, Private Interests	7	75,165	123,249	42,210	—	42,210	—	—
Tanker, Private Interests, Shallow Draft	10	34,010	59,262	20,000	—	—	20,000	—
Tanker, Private Interests, Coastal	1	2,345	3,450	1,440	—	—	—	1,440
TOTALS	4,709	35,838,764	51,496,746	20,903,948	9,099,090	4,132,330	6,915,000	757,618

Compiled by American Bureau of Shipping.

MARINE DEPARTMENT
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Princess Pat

(Continued from page 503)

Co., connected to the transmitter and receiver, located on the garboard strake on starboard side amidships. A radio transmitter and receiver is located in the chart room.

Power and lighting switchboards were designed and manufactured by Ets-Hokin & Galvan, who also installed all cable for power circuits, which are 60 cycle, 200 AC and lighting 60 cycle, 110 AC. Also supplied and installed by the same firm were the submerged lights in all bait carrying compartments and the CO_2 fire extinguishing equipment.

Carried on the raised deck aft is a 16'-0" motor workboat powered by a 93-hp Chrysler Ace, and also a 16'-0" net boat and a 12 ft. skiff, all built by F. Ross.

A New Repair Yard

(Continued from page 525)

marine and mechanical engineer of 34 years' experience. He started his career in the old Fore River Yard at Quincy, Mass., in 1911, and thereafter served with Westinghouse as engineer at Philadelphia and on the Pacific Coast. During the first world war he was a geared turbine engineer with the Emergency Fleet Corp., at Philadelphia. For many years he was vice president of Hunt Mirk & Co., engineers and contractors, of San Francisco, and has been chief engineer with the Ingalls Shipbuilding Corp. of Pascagoula, and the Western Pipe and Steel Co. of San Francisco. He is a graduate of the University of Pittsburgh and of Yale, and is a member of the Society of Naval Architects and Marine Engineers.

Mr. Luick, a graduate of Fresno State College and the University of California, has had extensive experience in accounting, auditing, and sales supervision with the San Joaquin Light and Power Co. and the Union Oil Co. of California. More recently he was cost accountant with the Kaiser Company and repair and construction auditor for two years with the U. S. Maritime Commission.

Erratum

In the article on "New Refrigeration for U.S.S. Relief," published in our August issue, the credit for designing and installing of insulation in the refrigerated spaces should have been given to George H. Freear of the Freear-Lorentzen Company, Oakland and San Francisco, California. Our apologies to Mr. Freear for this error.

Coupling Meets Severe Test

Several months ago the S.S. Otis Skinner, one of Uncle Sam's Liberty ships, returned to her home yard at Richmond, California, for battle damage repairs after being hit by a Japanese suicide plane off Leyte.

According to ship officials, the plane penetrated the starboard side abreast of hold No. 2, between the main and second decks, shearing off its wings. The fuselage went through the side of the ship into the 'tween cargo deck space, making a hole 35' x 15'. The plane's bomb continued on its course and exploded inboard on the port side, blowing a hole downward on the second deck 25' x 10'.

The force of the explosion bulged the deck upwards three feet and pushed out the shell plating about 18 inches.

A striking fact relative to the damage was that while the ruptures occurred in the hull or on the decks, the fire lines, which were joined by Rolagrip couplings, manufactured by the Gustin-Bacon Company of Kansas City, remained undamaged. These couplings withstood the full shock of the terrific concussion and intense heat, and held tight their grip upon the fire lines, which in turn functioned in good order, thereby enabling the crew to fight the fire until it was brought under control.

All damage has been completely repaired, and the ship is now engaged in the task of carrying vital supplies for the operations necessary on the Japanese mainland.

The extensive use of Rolagrip couplings on many types of cargo and naval vessels has contributed considerably to the increased output of new vessels, and also to the speedy repair of numerous damaged ships.



Rolagrip coupling from the S.S. Otis Skinner. Although the outside was corroded by heat and exposure, the inside rollers and gasket were in perfect condition.

New U.S.M.C. Regional Office Policy

Our reporter interviewed L. R. Sanford, Director of Construction for the United States Maritime Commission, asking for a statement concerning the new policy of the Commission regarding Regional Offices. Through the courtesy of Mr. Sanford, Pacific Marine Review is authorized to publish this important statement covering present policy. We know that our many friends in the Maritime industries will be greatly interested.



The resignation of Carl W. Fiesher (at right) as Regional Director of Construction for the West Coast United States Maritime Commission, and the assuming of this office by L. R. Sanford, in addition to his other duties, became effective September 1.

At the inception of the war, the United States Maritime Commission decided to decentralize its ship construction activities and established four Regional Offices for the purpose of expediting ship construction. This arrangement resulted in the greatest ship construction program ever known.

Some time ago in anticipation of the successful conclusion of the war and the necessity for ultimate recentralization of construction activities, the Maritime Commission commenced a consolidation program. In May of 1944, the Great Lakes Regional Office in Chicago was consolidated with the Gulf Regional Office in New Orleans. In July, 1945, the East Coast Regional Office in Philadelphia was consolidated with the former Great Lakes and Gulf Regional Offices into what was then termed the Eastern Region. The final step in this consolidation was to bring the West Coast Regional Office into the preceding group, thus consolidating all four former Regional Offices under a single supervision.

The Offices of Regional Directors as such have been abolished and L. R. Sanford, originally Regional Director of the Gulf States, has been designated as Director of Construction for the entire country with headquarters in New Orleans.

For the present, all new construction activities will be directed from the New Orleans Office and Mr. Sanford and his assistant, J. T. Gallagher, will make periodic visits to the Regional Office in Oakland, Chicago and Philadelphia. This consolidation will not only permit the Commission to establish and maintain a consistent policy with regard to ship construction activities and liquidation throughout the entire country, but will also make it a comparatively easy step to transfer that single supervision back to Washington ultimately when the Commission shall decide to recentralize construction activities.

As far as the several former Regional Offices are concerned, there will be substantial change in their functions, operation or policy and as far as the West Coast Regional Office is concerned, it will continue to function substantially as heretofore.



Three jubilant guests, Lt. Garey, USMS, Miss Barbara Watson, California operational manager, American Mail Line, and Captain Jonathan M. Wainwright, V, USMS, honored speaker, on "Japanese Surrender Day."

Celebrities Guests of W. O. A. M. M.'s on V-J Day

Before the sirens blew on the unofficial V-J day, August 14, the Women's Organization for the American Merchant Marine met in San Francisco to hear a vitally interesting merchant marine account given by Captain Jonathan M. Wainwright, V, U.S.M.S., commander of the newly commissioned S.S. Lakeland Victory, one of the last ships out of Kaiser's Richmond yards, and operated by The American South African Line.

In 1943, after receiving his Master's papers, Captain Wainwright took over the SS Bushward Washington.

While praising the efforts of the club in the "Adopt-a-Ship" program, he wistfully mentioned that he hoped a school in Monterey would adopt his ship, the SS Lakeland Victory, as Monterey is his home town.

In relating his experience in the Battle of Salerno, he told of the preparations in the spring of 1943, after the North African campaign, for the Italian job. In May, with 4000 tons of ammunition and war cargo in her hold, the SS Bushward Washington sailed out with a convoy. After an eventful crossing, 10 ships lost out of 84, the broken up convoy proceeded to a small port on the North African Coast, one of many that had been turned into huge dumps. The word had been passed that the Italian job was "going to be a lulu!"

On the second morning in an African port his ship sailed, loaded with some 400 troops, and soon came to an anchorage about a half mile off the Salerno beach.

It was a rugged morning, with ack-ack dropping all around and German light artillery splattering the ship so badly that it was practically impossible to unload the vitally needed vehicles and cargo. It took four days for the merchant marine crew to unload, even with the skipper constantly working the 50-ton boom over the No. 2 hatch, which carried the Sherman tanks and other heavy equipment.

In the afternoon of the fourth day while Wainwright was in the chart room on the port side of the stack plotting a new anchorage, a whistling sound spun him around to see a plane diving at the ship. Then—BOOM! The bomb hit on the port side of the stack, going straight down into the engine room. It was a delayed action bomb that demolished the engine room and rent a large hole in the starboard side.

Fire broke out and it was impossible to use the vessel's fire fighting equipment. The gasoline in one of the holds soon caught fire. This forced the Captain to call for abandon ship. As he told: "On board were some 400 soldiers who were reluctant about climbing down the landing nets. They had to be aided by having their knuckles rapped when they froze on the rails. When they were off the Gunnery Officer and I jumped."

These two were picked up by a landing craft in the vicinity and the crew of the craft returned to the Liberty to try to take off 20 men who were trapped aboard. The port boiler exploded as a fire boat came to the rescue. The fireboat captain wanted to know what was in No. 5 hatch. In spite of the bad news of high explosives, the fireboat threw in everything she had for the next 40 minutes, while the landing craft men took nine more survivors from the burning ship and transferred them to a tug.

About 0400 the following morning the fire had reached the No. 1 hatch (bomb hatch) and the fireworks began. It all went off at once—blowing the bow and forward part of the ship back to the bridge, spraying debris for a quarter of a mile.

"After the explosion the thought came—no more ship, go home. But by 0900 that morning, the Admiral sent for me and stated there was a stricken ship out in the bay, twice hit by bombs and still afloat. Would I go out and see if it could be salvaged?"

The Captain, with his Gunnery Officer, Chief Officer and Chief Engineer, went aboard the S.S. James W. Marshall for a survey. The human debris and wreckage were deplorable. In the holds there was 2500 tons of badly needed cargo. On deck there were no booms that could be rigged or equipment for unloading the cargo, and in the engine room the water was 30 feet deep. But the report went in that the ship would float and could be salvaged.

With his volunteer merchant marine salvage crew, which included several cooks, mess boys and some gun crew, he went aboard. For nine days they worked to clean up and discharge the cargo by hand. On the tenth day the skipper wangled a tow from a British ship going to North Africa. It took 3½ days at 4½ knots, riding so high that torpedoes streaked underneath, to cross the Mediterranean to Bizerte, where Captain Wainwright delivered the vessel to the War Shipping Administration.



Captain Jonathan M. Wainwright, V, USMS, who is sailing the Pacific for the first time as skipper in command of the SS Lakeland Victory. He has received all the medals for gallantry in action awarded by the U. S. Maritime Service.

Captain Wainwright was wounded when the Stuka bomber sank his ship, and won the Merchant Marine's Distinguished Service Medal for salvaging the abandoned S.S. James W. Marshall.

Sharing guest honors with Captain Wainwright were Lieutenant Gorey, U.S.M.S.; and Miss Barbara Watson, California operational manager of American Mail Line, who gave an inside summary of a woman's position as a general agent's representative on the waterfront.

Navy, WSA Commend Todd Repair Yards

Commendations citing repair work on Pacific Fleet destroyers and conversion of Victory cargo ships to troop transports were received recently by Todd Shipyards Corporation from the United States Navy and the War Shipping Administration.

After the return from her first voyage of the Aiken Victory, converted at the Todd Hoboken division, Captain Granville Conway, Deputy Administrator of the War Shipping Administration, sent the message of commendation to the Todd Corporation.

The Aiken Victory, one of forty Victory ships to be converted by Todd in the troopship program, arrived at the Hoboken yard on May 1, and the conversion work was completed in approximately six weeks.

CAPTAIN PETER F. BUTLER has joined the long list of Pacific Coast shipmasters displaying exceptional heroism and seamanship in this war. As master of the SS Hall Young, he was cited by the Navy for his deeds in saving his ship and cargo when attacked by an enemy plane, April 30, of this year. The vessel was under the management of the American-Hawaiian Steamship Co.



low of the head able and members attending the ugust 14 luncheon at the St. rancis in San rancisco of the Women's Organization for the merican Merchant Marine.



Rayburn W. Dunn, chemical engineer, recently became associated with Berry E. Dunn, his father, who is a distributor for Kearfott.

Rayburn Dunn Joins Up With Father

Rayburn W. Dunn is now associated with his father, Berry E. Dunn, who is Pacific Coast representative of the Kearfott Engineering Company of New York City, and the Torrey Roller Bushing Works of Bath, Maine.

Young Dunn received his education at the University of California, specializing in chemistry. He received his B.S. in 1933 and his M.S. in 1935.

Recently, he has been engaged in chemical research, under Professor E. O. Lawrence, at the Radiation Laboratory of the University of California. In this work, he was in charge of one of the analytical laboratories connected with the production of the now famous atomic bomb.

His other technical affiliations are: Member of the American Chemical Society, and a past president of the California Chapter of Gamma Alpha National Graduate Scientific Fraternity.

He is now busy becoming acquainted with the many friends of his father in the Marine fraternity of the Pacific Coast.

P. M. R. is pleased to announce that on August 1, Archie M. Stevenson who has been associated with the War Shipping Administration as assistant general counsel, has resumed his partnership in the firm of Dorr, Stevenson & Cooper, Merchants Exchange Building, San Francisco, Calif.



Captain Paul Cronk
U.S.C.G., Captain of S. F. Port.

Captain Cronk In Sick Bay

Home on sick leave after an operation at the Marine Hospital in San Francisco, Captain Paul Cronk, US CG, Captain of the Port of San Francisco, is doing convalescence duty.

Since the outbreak of World War II, he has been doing a fine job as U. S. Coast Guard Captain of the Port of San Francisco.

In the first war he saw service in France in the Marine Corps. Soon after the Armistice, he joined the Coast Guard as temporary commissioned officer and later became a regular officer. Through the years he has been stationed in Alaska, on the East Coast, Gulf Coast and had Ice Patrol duty on the Great Lakes. He came to San Francisco before the war from Galveston.



SHIPYARD CAPTAIN SUCCUMBS

Frederic Arthur Gainard, yard captain at U. S. Steel's Federal shipyards, died at his home in West Orange, New Jersey, on August 20. He directed sea trials and delivery runs of about 200 ships for war during nearly thee years of service with Federal.

New Coast Manager for Phelps Dodge



Harold Q. Noack, now with Phelps Dodge Copper Products Corp.

Phelps Dodge Copper Products Corporation has appointed **Harold Q. Noack** to serve as Pacific Coast manager, directing the sales of copper wire, tubing, cable and other products. His territory will include Washington, Oregon, Idaho, California, Nevada, Arizona, Oklahoma, Texas, New Mexico, Utah and the Hawaiian Islands, with headquarters at the Company's Los Angeles plant.

For more than 20 years, Noack held the position of the Pacific Coast sales manager of Hubbard & Company in charge of the western sales of Electric Pole Line Hardware for this concern. He was closely identified with the standardization program in the Electrical Industry having served on the Iron and Steel Committee of the California State Chamber of Commerce as well as in the Pacific Coast Electrical Association. He is past President of Emeryville Industries and a member of The Transportation Club, Engineer's Club and Family Club of San Francisco. During the war period he has contributed considerable time and effort to civic, Red Cross, and other war-aiding activities.

York School Closes

At special exercises last month, attended by high ranking officers of the Navy, the York Naval Training School, maintained and operated for the Navy by York Corporation, York, Pa., under the direction of Frederic B. Kinley, since 1941, graduated its last class and the activities of the school were officially transferred to the Naval Training School at Norfolk, Virginia.

The school, established five months before Pearl Harbor for the specialized training of naval personnel in the operation, maintenance and repair of refrigeration and air conditioning equipment, has trained 1271 men in the four years of its existence. One of the oldest of the Navy's special schools, it included in its enrollment not only naval personnel, but officers and enlisted men of the Marine Corps and Coast Guard, and even of the Army. Officers of the British Royal Navy and of the Brazilian Navy also attended the school. The school is unofficially known throughout the fleet as "the University of Air Conditioning."

LAST GRADUATING CLASS



President S. E. Louer of the York Corporation addresses the last class to be graduated from the York Naval Training School.

Bethlehem Steel Names Pacific Coast Head



W. M. Laughtan is Pacific Coast District gneral manager and is to be in charge of all Bethlehem shipbuilding and ship repairing operatians as well as sales in this district.

A. B. Homer, vice president in charge of shipbuilding, Bethlehem Steel Company, has announced the appointment of **W. M. Laughton** as general manager of the Pacific Coast District of the Company's Shipbuilding Division, effective August 1, with headquarters in San Francisco.

Mr. Laughton's appointment follows the establishing of a new basic management organization of Bethlehem's shipbuilding and ship repair yards, with all yards grouped by districts.

T. C. Ingersoll, while continuing as manager of the Bethlehem-Alameda Yard, becomes manager of the San Francisco Yard. **F. S. McGuigan** has been appointed manager of the Alameda Yard, succeeding Fred McLean, who has been given increased duties at the Bethlehem-Alameda Yard. **E. C. Rechtin** continues manager of the Company's San Pedro Yard.



E. C. Rechtin
Manager af San Pedro Yard.

F. S. McGuigan
Manager of Bethlehem-Alameda Yard.



Districts in which Bethlehem Shipbuilding and Ship Repair Yards are grouped, apart from the Pacific Coast District, are as follows:

NEW YORK DISTRICT—Staten Island Yard, Hoboken Yard, Brooklyn 27th Street Yard, and Brooklyn 56th Street Yard.

BOSTON DISTRICT — Quincy Yard, Hingham Yard, and Boston Yards.

BALTIMORE DISTRICT—Sparrows Point Yard, Baltimore Yard, Fairfield Yard.



T. C. Ingersoll

PERSONNEL CHANGES ANNOUNCED. Ferdinand Schmitz, Jr., president of Everett Pacific Shipbuilding and Dry Dock Company, recently announced two important executive changes.

O. A. Tucker, well known West Coast shipbuilding executive, has been appointed vice president and general manager of the Everett plant. Mr. Tucker came from Pacific Iron and Steel Company, Tacoma, where he was president and general manager. He took over his new duties at Everett on August 13.

The other important management change at the Company is the promotion of **James N. Cunningham** to the position of works manager. Mr. Cunningham has been associated with the firm since December, 1943, and for the past six months has been assistant works manager.

CONFERENCE AT CONSOLIDATED

P. M. R.'s photographer caught Charles W. Lee, production manager for Consolidated Steel Corporation, Ltd., conferring on August 15, "Jap Surrender Day," at Wilmington yard of Consolidated Steel. In on the conference, but not in the picture, was Alden Roach, president of Consolidated Steel. Captain Schumacher (at left), associated with Admiral Vickery of the U. S. Maritime Commission since February, was completing a flying tour of Pacific Coast shipyards.



WESTINGHOUSE ACQUIRES B. F. STURTEVANT COMPANY. Acquisition of the B. F. Sturtevant Company, of Boston, Mass., the pioneer in the design and manufacture of air handling and processing equipment, has been announced by A. W. Robertson, chairman of the Westinghouse Electric Corporation.

GENERAL ELECTRIC COMPANY'S SYRACUSE, NEW YORK PLANT, has developed a device that may ultimately replace bells, horns and other devices on buoys. It is a super-loudspeaker and is now being tried out in New York harbor. During a trial held in the presence of Coast Guard, police, and harbor officials, the speaker sent its message across the bay to ferryboats, cargo vessels and other craft. Under favorable conditions the new loudspeaker can send messages four miles.

BENDIX ESTABLISHES NEW INTERNATIONAL DIVISION.— The formation of a new division, Bendix International, to handle the comprehensive foreign trade program of Bendix Aviation Corporation was recently disclosed by Ernest R. Breech, president. Bendix International will be under the direction of Charles T. Zaoral, general manager, who joined the corporation as coordinator of foreign affairs.

THE SHERRILL INSTRUMENT COMPANY has been formed as a marketing and distribution agency for the products of the Sherrill Research Corporation, it is announced by the company, whose general offices are in Peru, Indiana.

Burl E. Sherrill, president and founder of the Research Corporation, also heads the new company, with Mark Donaldson as general sales manager. The Sherrill organization manufactures a complete line of marine, aviation and automotive compasses.

D. V. DANIELS, former marine representative of The Texas Company, has been transferred from the San Francisco office of the company to the Marine Sales Division in New York. **D. J. McQueeney** took over the duties as marine sales engineer in San Francisco district.

WESTERN PIPE & STEEL'S Lee W. Delhi, vice president, announced the promotion of **Marsh M. M. Fickert,** assistant chief engineer, to assume all duties formerly under the jurisdiction of F. J. Swaney. This change took effect August 1.

Those named as Chiefs of their various section in the new set-up under Mr. Fickert were: **Hugh Farquhart,** chief, Ship Repair engineer; **J. E. Kerr,** chief, Marine Engineering Design; **H. J. Kelley,** chief, Commercial Engineering Design.

Shoreside Personalities





At left: Bonnell W. Clark, vice president at Westinghouse, who awarded the merit badge of the company, the highest company award for distinguisher service, to Burrell S. Manuel (at right), who is vice president of the Westinghouse Electric Supply Co.

Westinghouse Honors Los Angelean

Burrell S. Manuel of Los Angeles, vice president of the Westinghouse Electric Supply Company, on July 3 received the Order of Merit of the Westinghouse Electric Corporation, highest company award for distinguished service. Presentation of the award was made by Bonnell W. Clark of Pittsburgh, Pa., vice president in charge of sales for the Corporation and president of the Supply Company, during brief ceremonies in Mr. Manuel's office.

In tangible recognition of Mr. Manuel's long and outstanding services to the company, he received a large bronze medal which bears on its face a silver "W" and his name, with the legend "Whom his fellow men delight to honor." The medal was designed by Rene Chambellan, the sculptor.

BONNELL W. CLARK, vice president in charge of sales for the Westinghouse Electric Corporation, since March, 1942, is also president of the Westinghouse Electric Supply Co. He has seen the latter concern grow from 14 electrical jobbing houses when he joined it as a special representative in 1925, to a network of branches in 79 principal market centers of the country.

Lubricants Company Gives Special Service

The Ryt-Oyl Lubricants Co., and its predecessor companies have been engaged in the lubricants business in San Francisco since 1904. Recently Charles E. Sweetman retired and sold his interest to several Eastern oil men, who feel quite optimistic about the prospects on the Pacific Coast for the lubricating oil business.

John J. Franzman, the new president of the company, is in charge of all operations on the Coast, with the head office and warehouse located at 115 Main Street, San Francisco, and branch offices at Los Angeles, Portland and Seattle. The company is the Pacific Coast agent for the Penolamarine Lubricants, and services ships under contract with the Standard Oil Company of New Jersey. A valuable time saving lubricants and engineering service is rendered by the company's engineers to ship operators, by recommending the correct lubricants for use on all kinds of marine machinery.

In addition to the optimistic views of Pacific Coast business in the future, held by the new men in the company, they also feel that the Coast offers heretofore unseen possibilities of transporting lubricating oil stocks from Eastern points for immediate delivery to the large oil marketing organizations of premium lubricants.



John J. Franzman, new president.

W.S.A.'s "Andy" Wilson

Behind the mammoth job of recruitment and manning of ships for the War Shipping Administration on the Pacific Coast is Andrew "Andy" Wilson, soft spoken, quiet operating and recognized as another executive who has contributed so much to the winning of the war without benefit of uniform or rank.

"Andy" has been in maritime occupation since 1912. He started as a stevedore at Los Angeles Harbor, then went with Hammond Lumber Company, continuing with them until he advanced as Superintendent of their lumber yard at Terminal Island. Then he joined the Christenson Hammond Shipping Company in 1933, and served as their port agent until 1939, when he became associated with the Waterfront Employers' Association and Pacific American Shipowners Association as their labor relations representative for Southern California.

In July, 1942, he joined the Government as port representative, Recruitment and Manning Organization in Los Angeles. A year later he was promoted to Pacific Coast Regional Representative, his present post, with headquarters in San Francisco.

"Andy" is a member of the Los Angeles Bilge Club and a charter member of the Propeller Club of the United States, Port of Los Angeles.

Northwest Propeller News

Postwar plans of the State of Washington with particular reference to terminals and intra-port switching, were discussed at the July dinner meeting of the Propeller Club of the United States, Port of Seattle.

Speakers included Art Garton, director of the State Department of Conservation and Development, representing Gov. Mon C. Wallgren, Col. W. C. Bickford, general manager and chief engineer of the Port of Seattle, and Howard G. Costigan, executive secretary of Governor Wallgren's Advisory Committee.

Garton spoke on the subject, "Maritime Plans of the State Administration," while Colonel Bickford discussed plans for "Ports and Port Facilities in the State." Costigan explained how the Propeller Club could cooperate with the State in its program for expansion of the Pacific Northwest marine industry.

The program provoked a barrage of questions fired at the State officials by Propeller Club members. Lively discussion of the maritime potentialities of Seattle evidenced the vigor with which the State of Washington is going after the development of a prosperous marine industry.

Minot Joins Cox & Stevens

Francis Minot has joined the staff of Cox & Stevens, Inc., naval architects and marine engineers, New York, according to announcement by P. L. Rhodes, naval architect of that firm.



Francis Minot

Educated at Harvard and M.I.T., he served in the Navy in the First World War, and has just completed several years of service with the Army Transportation Corp. as naval architect in charge of stability, damage control, and other technical aspects of ship conversion. For many years he was associated with Prof. George Owen of M.I.T. in the firm of Owen & Minot, engaged primarily in consulting work.

Cox & Stevens, with a staff of 500, are actively engaged in numerous post-war projects in addition to their work for the various Federal agencies.



Kenneth Allan Hulme, now Master.

Young Master

Kenneth Allan Hulme, recently returned to San Francisco on the troopship Young America, where he was chief officer for 18 months, during the invasion of the Marshalls, Saipan, Tinian, Guam and Leyte Gulf. He recently acquired an unlimited Masters License, "any ocean, any tons," at the age of 23 years.

Through the Masters, Mates and Pilot's Association he secured a position as master of a troop transport The William F. Cody, operated by the American President Lines, and now sailing the Atlantic ocean routes.

Before joining the Merchant Marine, he was known as a very clever yachtsman around San Francisco bay, and graduated from the California Maritime Academy in July, 1942.

He is the son of Allan K. Hulme, vice president of the General Steamship Corporation, Ltd., of San Francisco.



Captain George F. Shecklen, USNR, vice president and general manager and a director of the Radiomarine Corporation of America.

Radio Marine Elects

Captain George F. Shecklen, USNR, has been elected vice president and general manager and also a director of the Radiomarine Corporation of America, it was announced by Charles J. Pannill, president of Radiomarine. Before entering the Navy on active duty in December, 1941, Captain Shecklen was commercial manager of RCA Communications, Inc.

Following his recall to active service with the rank of Lieutenant Commander, he served successively as Communication Officer, National Censorship, New York; District Communication Officer, Third Naval District; Aide to General Robert C. Davis, USA, on a special mission to South America for the State Department, and as Liaison Officer with the U. S. Commercial Company. In March, 1944, he was transferred to the staff of the Commander-in-Chief, U. S. Pacific Fleet, and for 15 months was stationed at Pearl Harbor and in the Western Carolines. He came back to New York in July.



At left: Rear Admiral Lyndon Spencer, US CG, has been named to head the Merchant Marine Inspection Division. At right: Captain Robert A. Smyth, USCGR, recently promoted to rank of Captain. He is chief of the Coast Guard's Merchant Marine Technical Division and is also member of the Merchant Marine Council.

ADMIRAL SPENCER, Assistant Chief Operations Officer, now heads the Merchant Marine Inspection Division, the Merchant Marine Personnel Division and the Port Security Division of the Coast Guard. The three divisions formerly had been under the cognizance of the Chief Operations Officer.

EDWARD H. JOHNSON, associated with the San Francisco office of the Lunkenheimer Company during the past year, in the sale of Lunkenheimer valves throughout the West, is directing the company's affairs in this territory during the absence of James Castle. Mr. Castle has been ill for the past several months.

THOMAS G. BAIRD, who represents the Standard Steam Winch & Hoist Co., Inc., of New York, in the San Francisco Bay Area, announces that he carries a complete stock of spare parts for the American Hoist and Derrick winches, Emerson Walker windlasses and the Wilson-Pirrie steering engine as used on Liberty ships sailing into this port. Tom Baird, who is well known among the marine fraternity in San Francisco, has represented this company for years.

WORD HAS BEEN RECEIVED of the appointment of **Commander Francis (Frank) Leahy,** U. S. Coast Guard, from San Francisco, who was formerly United States Inspector of Boilers, to the staff of Lieutenant General Lucius Clay, American military governor of Germany. Commander Leahy's duties place on him the responsibility for river navigation and the inland waterways of the American occupation zone in Germany.

JOHN W. LAVERACK was elected president of The Dampney Company of America, Hyde Park, Massachusetts. He succeeds Clarence J. Hunter who becomes chairman of the Board and technical director for special concentration on rearch and development.

W. T. RILEY became a member of of the Shipyard Disposal Committee, of the U. S. Maritime Commission, effective August 1, following the resignation of A. F. Coon.

H. S. WOODMAN, who came to San Francisco from New York in February to initiate operations on this coast of the Marine Transport Lines, announces that he is returning to the New York office and that **F. J. Schmitt** has arrived to take charge of the San Francisco office. Schmitt was assistant operations manager in New York City.



Edward Darresten, general manager of The Bay Cities Asbestos Company of Oakland, California.

ROY E. ANDERSON WAS NAMED Director of the Division of Tanker Operation, August 1, succeeding **John W. Bancker,** elected a vice president of the American Merchant Marine Institute, Inc. Mr. Bancker had formerly been with the Socony-Vacuum Oil Co. and so had Mr. Anderson. L. A. Smith, formerly with Standard Oil of California, has been named assistant director. Mr. Smith has been with the WSA on loan since 1943.



Thomas S. Ryan, recent appointed representative in California for C. H. Wheeler Mfg. Co. of Philadelphia

HICKS MARINE ENGINES RESUME MANUFACTURE. **Alex Thomson,** new owner of the Hicks heavy duty marine gas engine, recently acquired the manufacturing rights from the Yuba Company. New headquarters will be in Martinez, California, where Thomson now operates the Bay Specialties Company machine shop.

An addition to the present shop is going up immediately and will be used exclusively for assembling and testing Hicks engines.

The most modern equipment is being used, including internal, external, centerless, and surface grinding facilities. Thirteen machinists are already at work. Six, 8, 10, 12, and 16 hp. models are being manufactured.

While only a few new engines are available at this time, Thomson expects production to be rolling in three months. At present all part replacements may be obtained either in Martinez or from George Carle, Fishermen's Wharf, San Francisco.

Marine Exchange Activities

New Members

The roster of the Marine Exchange has been expanded with acceptance of membership from the following:

Arctic Chemical Company
Captain C. A. Christiansen
E. F. Drew & Company
Hunt, Mirk Company
Hawley Industries
E. E. Meyers, Bank of America Traveler's Check Dept.
Parry Navigation Company
Poultry Producers of Central California
Rodpak Manufacturing Company
Seamen's Church Institute
Smith Lynden & Company
J. H. Winchester & Company, Inc.
L. A. Young Spring & Wire Company

Harbor Day Exhibit

The exhibit displayed in the lobby of the Ferry Building during the week of Harbor Day drew a large and interested audience.

The exhibit was arranged for the Junior Chamber of Commerce, sponsors of Harbor Day, by Frank Janov of the Marine Exchange.

The exhibitors were:

American President Lines
Ames, W. R., & Co.
Avoset Company
Bacon, Edward R., Co.
Ets-Hokin & Galvan
General Electric Co.
General Engineering & Drydock Co.
Grace Line
Haultain, Philip E.
Hough & Egbert
Johnson, Robert L., & Co.
Malott & Peterson
Matson Navigation Company
McCormick S. S. Company
Moore Dry Dock Co.
Pan American Airways
Permanente Metals Corp.
Ray Oil Burner Co.
Rodpak Company
Stow Manufacturing Co.
Travelers Aid
United Seaman Service
United States Army Transport Corps
United States Coast Guard
United States Maritime Service
United States Twelfth Naval District
United States War Shipping Administration
Victor Equipment Company
Weeks-Howe Emerson
Western Fire & Equipment Company
Westinghouse Electric Corp.
Women's Organization for the American Merchant Marine

Reception on Exchange Floor

The Junior Chamber of Commerce was host on the Exchange Floor on the afternoon of Harbor Day to over 600 officials, including mayors and supervisors from the cities and counties of Northern California.

The guests were greeted by Lt. Comdr. Joseph T. O'Callahan, chaplain of the USS Franklin, the aircraft carrier that fought its way back to the United States after the Japs had hit her in their home waters.

Father O'Callahan told of the heroic work of the crew and medical corps aboard the ship when disaster struck.

Model on Display

Now on display on the Exchange Floor is a 4½-foot model of the sloop Gjoa, of 47 tons net, with which Roald Amundsen and his crew negotiated the Northwest Passage, 1903-1908.

The original vessel is in Golden Gate Park.

Figurines of Amundsen and his crew, carved out of the Gjoa's mast, are to be seen aboard the model.

Made for Erik Krag by Preston Dahl Models, the model is on a ½-inch scale.

Radio Talk by Roth

On the afternoon of Harbor Day, Almon E. Roth, president of the American Federation of Shipping, spoke over KGO on the Citizens for Victory Hour.

Mr. Roth stressed the importance of the harbor to the Bay Area and the necessity of maintaining the American merchant marine.

This broadcast is one of many sponsored by the Marine Exchange, all of which are designed to impress the approximately three million citizens of the Bay Area with the importance to them individually of the harbor's activities, and that any letdown in or interference with these activities will seriously be felt by every family.

POCKET SIZE BOOKLET ON MERCHANT MARINE

A popular little blue booklet, entitled "Ships of the Merchant Marine," produced by Tide Water Associated Oil Company, is causing a wave of favorable comment on the West Coast. This brochure was inspired by growing public interest in the activities and future of the American Merchant Marine.

Its 30 pages are filled with pictures, data and silhouette models of the principal types of vessels comprising the United States great merchant fleet.



Floor and office of the San Francisco Marine Exchange.

Obituaries

CAPTAIN A. A. SAWYER, a well known retired member of the San Francisco Bar Pilots Association, died at his residence in Larkspur on July 20.

CRANE BOARD CHAIRMAN DIES. After being with Crane Co. for 53 years, John B. Berryman, chairman of its Board of Directors since 1935, died in Chicago on August 10, at the age of 83.

Mr. Berryman, born and educated in Canada, came to Minneapolis in 1885 as a bookkeeper in the plumbing supply company that later became Crane Co.'s Minneapolis branch. He became manager of that branch; manager of the engineering sales department in Chicago; secretary of the company; director and 3rd vice president; 1st vice president; and president of the company in 1932. In 1935 he relinquished active management to younger men.



HAROLD H. EBEY, aged 65, one of the most influential men in Pacific Coast shipping in the prewar years, died suddenly in August in San Francisco. Prior to the war, he was Pacific Coast representative of the old Cosmos Line, succeeding the late Dingle Gray. During the war years he became West Coast director of the U. S. Shipping Board. With the return of peace, he became owners' representative for the Pacific Coast of the Hamburg-American Line, which had absorbed the Cosmos Line and other German shipping interests. Afterwards, he held several positions of power and influence in shipping on this range. In 1935, he became connected with the foreign trade house of Otis, McAllister & Co., a connection he continued until his sudden death.

RAY BUSH, a partner of the veteran copra house of Atkins, Kroll & Co., died late in July, only two weeks after he landed in Manila from his San Francisco headquarters. Death was caused by a heart attack induced by overwork during wartime. Mr. Bush was 45. He was on a Government mission to do with exports of copra when stricken.

His widow and daughter reside in Ross. A brother, William J. Bush, is vice president of American President Lines.

HARRISON R. "HAP" McLARNIN, widely known Southern California shipping executive, died on July 21. He was widely known in Pacific Coast marine circles. Mr. McLarnin's father was the first agent to handle the business of W. R. Grace & Co., in Los Angeles, and McLarnin succeeded him to the business. When Grace opened their own offices in the South he was identified with the company until 1934 when he resigned.

OBITUARY. The sudden death of Edward G. White on July 2, at his home in Concord, where he had been practicing law since leaving the NYK line after Pearl Harbor, was a shock to the many friends of the popular and widely known former general passenger manager. Mr. White was ill only a few days and there was no anxiety about his condition.

He had engaged in the steamship business for a quarter of a century and was known in rail, air and water transportation throughout the nation.



TUNA! No Time To Waste!



Time is vital to these men. Their job is to get to profitable tuna waters as quickly as possible, devote all their energy to fishing when the run is on, and get back to market with every pound caught. For these days all the fish the industry can produce is needed.

To make a profitable haul, a tuna vessel may have to run all the way down to the West Coast of South America.

Perhaps that's why the designer and well-known Pacific boat builder, Anthony Martinolich, specified Sperry equipment aboard his new super tuna clipper, *Pan American*. He knew that on this long run the fastest time could be made by steering straighter courses.

With the Sperry Gyro-Pilot at the rudder and the Sperry Gyro-Compass in command of the course, the *Pan American* can make her cruise in record time. Not only is *time* saved, there is a double economy—*fuel!*

Besides automatic steering with "Metal Mike," the Sperry Steering System permits hand-electric and emergency-hand steering through shafting and cable. An Electric Rudder Indicator provides a positive indication of rudder position at all times. Two 12-inch Incandescent Searchlights complete the Sperry equipment aboard the *Pan American*.

If you're thinking of new ships, remember that Sperry equipment can help make them more profitable.



The 149' 8" super tuna clipper Pan American, fishing for Sun Harbor Packing Company, of San Diego, has Sperry Gyro-Compass, Sperry Gyro-Pilot, Sperry Steering Engine, Sperry Searchlights, and Sperry Electric Rudder Indicator equipment.

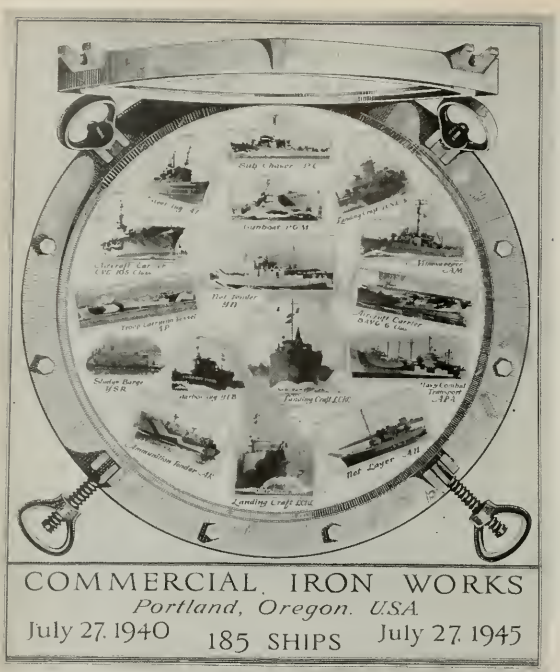
Sperry Gyroscope Company, Inc. GREAT NECK, N.Y.

Division of the Sperry Corporation

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ON THE WAYS—Continued

LAUNCHINGS OF THREE CALIFORNIA YARDS

From July 15 to August 25

CALIFORNIA SHIPBUILDING CORPORATION

Terminal Island

SS Roswell Victory, July 17
SS Bessemer Victory, July 26
SS North Platte Victory, Aug. 3
SS Oshkosh Victory, Aug. 9
SS Hattiesburg Victory, Aug. 14

CONSOLIDATED STEEL CORPORATION

Wilmington Shipyard

Coastal Buccaneer, July 18
Coastal Cadet, July 26
M.S. Crown Knot, Aug. 4
Coastal Rambler, Aug. 7
Coastal Monarch, Aug. 15
Coastal Telegrapher, Aug. 22
Coastal Charger, Aug. 23

MARINSHIP CORPORATION

Sausalito

Tankers
Wheeler Hills, July 15
USS Concho, July 25
USS Conecuh, Aug. 10
SS Fruitvale Hills, Aug. 25



VICTORY AT CALSHIP

When news of Japanese surrender reached Calship the men working the cranes formed a huge V while co-workers below cheered the announcement on August 14. The women workers, Mrs. Robbie W. Roberts, welder, hangs crepe on Hirohito as soon as the announcement came through. With her are sisters who work at Calship, Miss Ruth Diemer, burner, and Mrs. Georgia Enochs, burner in plate shop. They are pointing at pictures of Mussolini, who required 230 ships from Calship before giving up the ghost, and Hitler, who took 430 Calship vessels before cracking.



VAPOR CAR HEATING APPOINTS REPRESENTATIVE

Hough & Egbert Company, San Francisco, are pleased to announce that they have been appointed as service agents for the Vapor Car Heating Company of Chicago, Illinois. This heating company has installed a large number of their Vapor Clarkson boilers for auxiliary heating purposes on vessels built by the United States Maritime Commission, notably on the V-4 tugs and the C1MAV1 motorships.

A complete line of spare parts, replacement units, etc., for the boilers on these vessels is now in stock in San Francisco and the servicing of these boilers is under the jurisdiction of Fred Wilkinson. At San Pedro the service work will be under the aegis of David Steward, engineer for the company.

Plans are now under way to have this same service extended to Seattle and the Northwest.

This places the marine service work of the Vapor Car Heating Company in very competent hands and excellent service will be rendered.

Edward S. Hough, the principal of the firm, is well known for his many years of constructive work along the waterfront in San Francisco and we congratulate Vapor on making such a wise selection for their service organization.

The company also represents Walter Kidde & Company, Inc., of New York, pioneers in carbon dioxide fire protection equipment: the American Engineering Company of Philadelphia, Pennsylvania; the Lane Lireboat and Davit Company of Flushing, Long Island. They also manufacture and sell the Hough Patent Boiler Feed Check Valve, well and favorably known throughout the marine field for its efficiency in eliminating the hammer in boiler feed water lines.

Pacific Coast Shipbuilding, Ship Repairing, and Boat Building Yards

Directory of Executives

ALBINA ENG. & MACHINE WORKS, Inc.
2103 N. Clark Ave.
Portland 12, Oregon
President: L. R. Hussa.
Vice President: P. L. Symons.
Secretary: T. J. Cousins.
Manager: L. R. Hussa.
Treasurer: Dale L. Caldwell.
Naval Architect: C. F. Butler.
Purchasing Agent: W. D. Hughes.

AMES SHIPBUILDING & DRYDOCK COMPANY
3200 26th Ave. S.W.
Seattle 6, Washington
President: J. A. Baillargeon.
Vice President: Keith G. Fisken.
Manager: R. L. Albin.
Superintendent: J. C. Lane.
Chief Engineer: A. L. Hiles.
Purchasing Agent: E. C. Gaumnitz.

AMSHIP CORP.
Foot of Paru St.
Alameda, Calif.
President: George W. Baker, Jr.
Vice President: C. E. Strobel.
Operations Manager: John Steen.
Secretary: Arthur L. Dahl, Jr.
Treasurer: Juilliard McDonald.

ANACORTES SHIPWAYS, INC.
Box 111
Anacortes, Washington
President: L. P. Clark.
Vice Pres.: W. P. Yaw & D. M. Drake.
Secretary: E. E. Carroll.
Naval Architect: H. C. Hanson.
General Supt.: Charles Taylor.
Purchasing Agent Harrison Newkirk.

ANDERSON & CHRISTOFANI
Innes & Griffiths Sts.
San Francisco, Calif.

ASSOCIATED SHIPBUILDERS
Plant No. 1, Harbor Island Plant
2727-16th Ave. S. W.
Seattle, Wash.
General Manager: G. H. Stebbins.
Gen. Supt.: C. M. Rohda.
Chief Engineer: C. W. Johnson.
Procurement Manager: R. K. Jaggar.
Purchasing Agent: E. B. Devener.

Plant No. 2, Lake Union Plant
1515 Fairview No.
Seattle, Wash.
General Manager: G. H. Stebbins.
Asst. General Manager: H. W. Blaney.
Naval Architect: B. R. Richards.
Purchasing Agent: A. T. Harris.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.
President: Joseph M. Dyer.
Vice President and Manager: G. T McClean.
Treasurer: Geo. C. Sheahan.
Naval Architect: Joseph M. Dyer.
Chief Engineer: W. H. Dole.
Purchasing Agent: Richard Schroeder.

BALLARD MARINE RAILWAY CO.
5351-24th, N. W.
Seattle, Washington
President: W. G. Fryberg.
Vice President: E. C. Smith
Manager: H. F. Fryberg.

BARBEE MARINE YARDS, INC.
Foot of 26th Ave. N. W.
Seattle, Washington
Plant No. 2
Bryn Mawr, Wash.
President: E. P. Donnelly.
Vice President: D. F. Mitchell.
Manager: E. P. Donnelly.
Naval Architect: Edwin Monk.
Purchasing Agent: P. L. Douglas.

BASALT ROCK CO., INC.
8th & River Sts.
Napa, California
President & Mgr.: A. G. Streblow.
Vice Pres.: Walter Fawcett.
Asst. Mgr.: E. F. Brovelli.
Naval Architect: Don McCall.
Chief Engineer: Ed Godsil.
Purchasing Agent: J. E. Godley.

BELLINGHAM IRON WORKS, INC.
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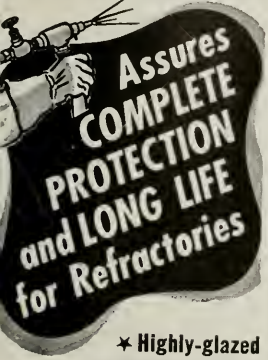
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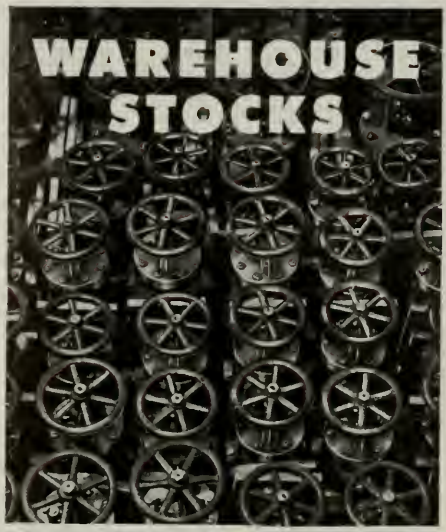
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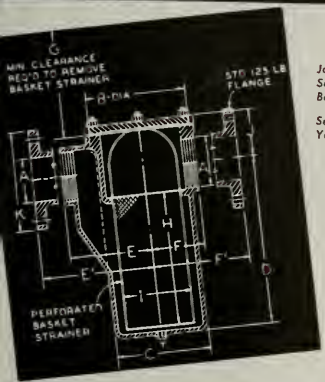
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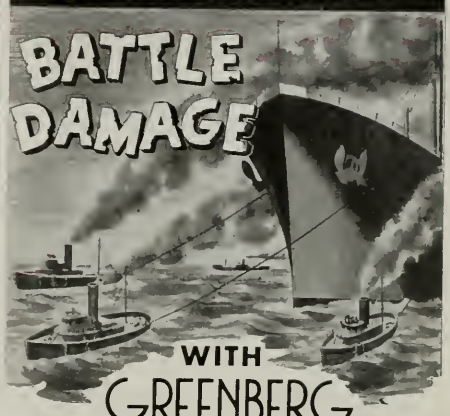
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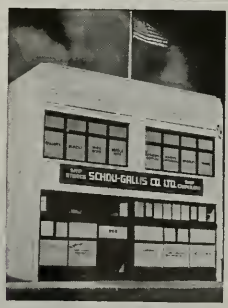
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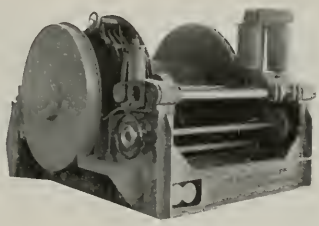
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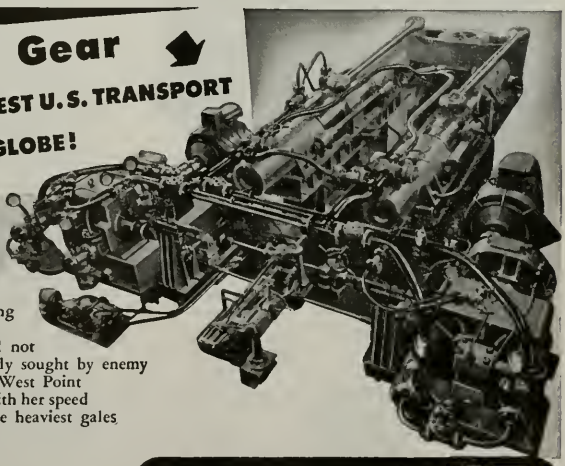
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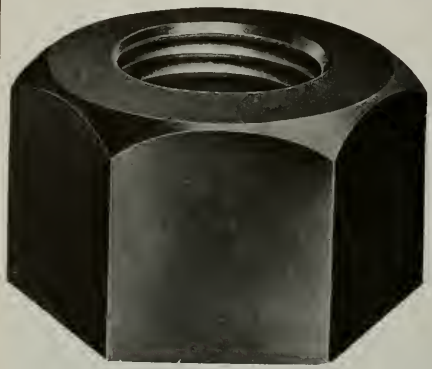
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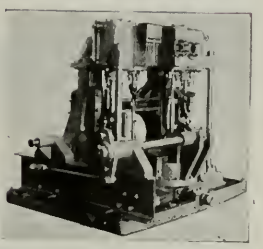
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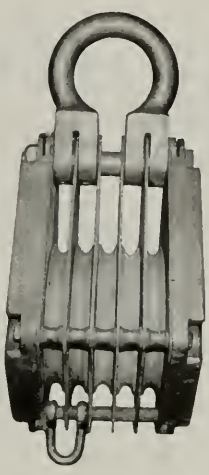
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The Consul for Ireland, 84 State St., Boston, Mass., U. S. A.

The Consul for Ireland, Wrigley Building, 400 North Michigan Ave., Chicago, Ill., U.S.A.

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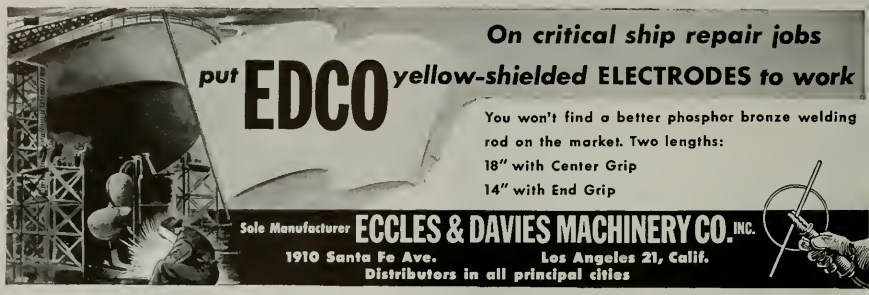
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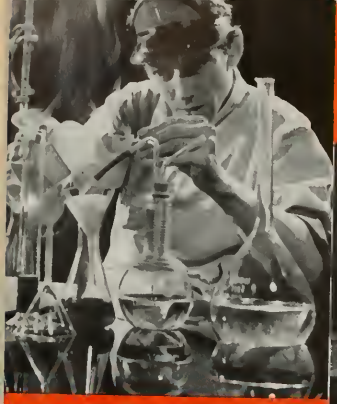
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bscription rates:
year, $1.50; two years,
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e copies, 25c.

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PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
Offices in: NEW YORK CITY . . . . . 16 West 46th Street, Telephone BRyant 9-8436
LOS ANGELES . . . . . 816 West 5th Street, 13. Telephone MIchigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.

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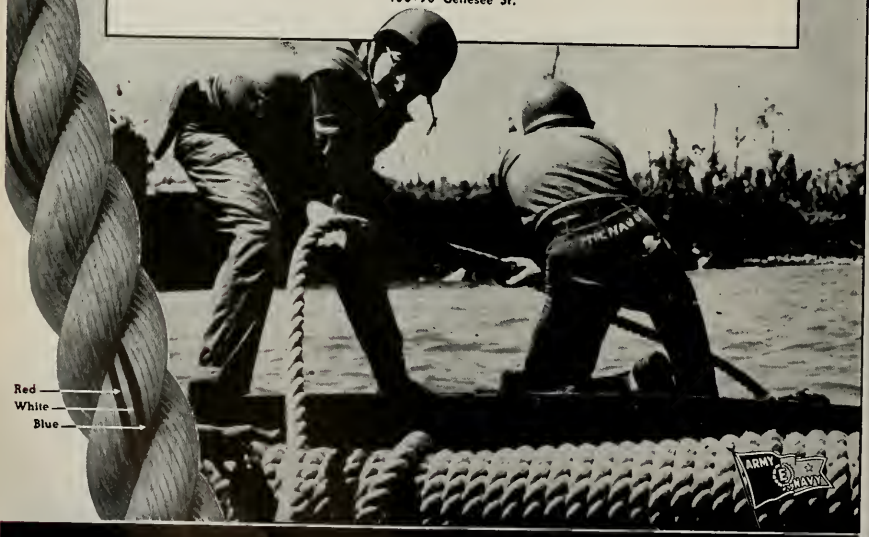
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The Intercoastal Situation

Interstate Commerce Commission has granted the application of War Shipping Administration that they be awarded a certificate to reopen the intercoastal trade routes with as many ships as "the trade will carry," to be operated by commercial steamship firms acting as agents for the administration.

Pursuant to this permission ten intercoastal steamship operators, maintaining operating organizations on the Pacific Coast, were given the go-ahead signal by WSA, and ships are now on berth for intercoastal loading. The present outlook is that before the end of October a number of modern steamers will be on the run with full cargo holds, and it is estimated that within three months 30 or more steamers will have cleared on this run.

This is a trial operation under WSA control and with the usual agency agreement. The cost figures for voyage operations will be watched with great care and great interest. On the part of American ship operators these figures will be awaited with some pessimism mixed with a great deal of hope.

In a letter supporting this application Admiral Emory S. Land, the chairman of WSA, set before the chairman of ICC a brief statement of the prewar position of the intercoastal operators and their wartime sacrifices. Said Admiral Land:

"Before the war our coastwise and intercoastal shipping constituted about 70 per cent of our entire ocean-going merchant marine. Out of approximately 11,000,000 deadweight tons of shipping in 1939, only about 3,000,000 deadweight tons were engaged in foreign trade. The bulk of our shipping resources was engaged in domestic trade and **did not receive Government subsidies.** While we hope to increase our foreign shipping, it is obvious that we must always rely upon our **unsubsidized** domestic trade for the **bulk of our national defense shipping reserves.**

"Shortly after the outbreak of World War II, our domestic shipping resources were drafted for war service. With few exceptions—such as the coastwise coal trade and services to our island possessions—existing domestic services were suspended. The vessels and their personnel and management were transferred to active war service. The functions of these vessels during the crucial period of the war and the heroism of the crews in all zones of war are well known. The domestic business of the companies was completely disrupted, interior offices were abandoned, traffic departments were discontinued, soliciting of cargo and trade contracts ceased and their transportation business was transferred to the rails. For over three years, the steamship industry unhesitatingly and whole-heartedly cooperated in these measures, no matter what sacrifice was involved. These companies and their employees are therefore entitled, as a matter of fundamental fair play, to comparable treatment of the returning servicemen. They should be rehabilitated, have their trade back, their jobs back, and an opportunity for future progress. They have earned these

opportunities and the Government should exert every effort to see that they are received.

"Since the Government has disrupted these services and has a vital interest in their restoration, the Government owes the industry every assistance in finding a solution to these difficulties. The domestic trade steamship industry suffered from several years of financial anaemia before the war. It was a very sick industry, as fully set forth in the Maritime Commission survey of 1939. To some extent, the problems of the industry resulted from depressed and noncompensatory freight rates established by the rails in Section 4 proceedings. These depressants must be removed by cooperative action of both the rails and water carriers. The needs of our national defense and of our economy make it essential that water transportation systems be reestablished. The cooperation of the rails in rate and other matters will make it possible to restore the industry quickly to private ownership and operations. **The alternative is Government ownership, a threat which should be as alarming to the rails as it is to me.** I hope that railroad management will see the problem in its proper perspective and adopt a broad-gaged view of the solution; that they will see the wisdom and necessity of permitting a privately owned and operated steamship industry to survive and prosper and abandon all lingering hopes of destroying water competition; that to this end they will make necessary adjustments in rates or practices where required, thus avoiding Government intervention, which would otherwise be inevitable. The same attitude, of course, is also required of the water carriers.

"WSA will support the water carriers to the utmost in their effort to get a square deal. That is the only course consistent with national interest. It is due the operators, the unions, the stevedores, the ship repairers, the port authorities and other interests who have so whole-heartedly cooperated in the war effort. Privately owned and operated coastwise and intercoastal water transportation must be restored as a profitable industry."

These are very heartening words from the head of a Government bureau, and judging from Admiral Land's past performance they hold out a great deal of hope for future intercoastal operation.

Operators are somewhat pessimistic because of the economic factors involved in the present position of labor and Government. The recent award of $45.00 a month increase in the basic wage of seamen is a 77 per cent advance over pre-war wages. This increase is figured to up the operating voyage costs of a C-3 by approximately 30 per cent. This is a big handicap to overcome when the present position of the Government frowns on any increase in the cost of living, and therefore on any increase in freight rates.

Other disturbing factors due to the same basic cause—higher labor wages—are the greatly increased costs of cargo handling and of ship voyage repairs. Some shipowners claim that in comparison with pre-war costs the present ship repair bills show a three- to fourfold increase. Cargo handling costs are about double those of pre-war operations.

There are various ways in which the cost per ton mile of intercoastal and coastwise operation might be reduced with the cooperation of the Federal Government. Among these are:

(1) Pre-war operation in this trade was largely in steamers with rather obsolete power plants and at cruising speeds of around 12 to 13 knots. With C-3's or equivalent vessels, two ships might, on an annual basis, carry as much revenue freight as three of the pre-war slower and smaller capacity ships. This in itself tends to lower the cost per ton mile if the capital investment in the ships is not too high. Since Government owns all the ships it will control this capital investment through the pending Ship Sales Bill.

(2) Panama Canal tolls are a large item in intercoastal voyage expense that could easily be eliminated, or greatly lowered, by the Federal Government through slight adjustment of treaties. This adjustment ought to be easy at this time when the principal signatories of these treaties are asking so much from the United States.

(3) A thorough and unbiased engineering study on cargo handling by the U. S. Maritime Commission might bring out some practical ideas on reducing the costs of terminal operations that form perhaps the largest item in the cost of American ship operation, particularly in the coastwise and intercoastal trades. An economic speeding up of these operations, through the use of mechanical cargo handling equipment, could eliminate a considerable portion of voyage expense for vessels in these trades.

(4) The simplification of Federal controls is another item for which intercoastal and all other branches of American shipping have long hoped. Certainly the War Shipping Administration must have learned in the past four years just how expensive and how burdensome our present system has become. A coordinated single bureau for the control of shipping, based on the ideas back of such an organization as the British Board of Trade, could remove considerable expense and unlimited annoyance from American ship operation.

The future size of our merchant marine is dependent directly on the intelligent development of a new type of National Shipping Policy—a policy which will help management, labor, and Government to understand one another and to work together for the common good. We can operate a merchant marine effectively and economically only if there is hearty cooperation among these three factors.

Assuming that such a shipping policy is necessary, it is evident that shipping management should assume a more active leadership in the development of better public relations so that their contributions to such policies would find favor in political circles. The American Federation of Shipping is a long step in this direction, but it might be greatly bolstered through a more active participation in public affairs by shipping management in local and district offices.

In this connection we remember a speech by Roger Lapham (a great intercoastal and foreign shipping executive and a great mayor to the city of San Francisco), in which he suggested that part of the training of every steamship operating executive should be running for office, so that he could learn something about selling his aims and ideas, and his personality, to the public.

Guam—
Busiest South Pacific Port



Upper: Night and day, through storm and clear weather, the sound of wings reverberated over Orote Field, Orote Point, Guam. Now that the war has ended, there is time to pause and admire the solid functional design, the untiring effort that went into its construction.

Lower: For one tragic period, the Stars and Stripes were hauled down from the island of Guam in the Pacific. It's a commentary on the U. S. and its men that the flag now waves over a much more complex and built-up base than ever before. Apra harbor choked with ships bearing fighting men and the sinews of war to the front; at the left is Orote Point airstrip, widened and lengthened for the spreading wings of the eagle. There are 113 miles of paved roads on Guam, of which 20 are four-lane highways; and for the voice and messages of war, the telephone system has seven main exchanges and 125 branch exchanges.

(Official U. S. Navy Photographs)

U. S. NAVA



Captain N. L. Rowlings, U. S. N., Commanding Officer, Naval Dry Docks, Hunters Point.

THE CITY AND COUNTY of San Francisco forms the northern tip of the peninsula that separates the southern arm of San Francisco Bay from the Pacific Ocean. At the southeast corner of the urban area, and about six miles south of the center of San Francisco's active waterfront, a small, hilly peninsula juts out into the waters of the bay. The tip of this small peninsula has been known since pioneer days as Hunters Point.

This tip is a rock formation, dense enough to form a very good foundation and yet soft enough to be cut with comparative ease. At the edge of the rock there is over forty feet of water. These conditions make an ideal site for a graving dock for large ships.

The first dock carved out of this rock was under the magic promotional touch of W. C. Ralston, who with characteristic vision planned a dock large enough to take any vessel then afloat, with the single exception of the steamer Great Eastern. This was in the late sixties of last century. With this start, during the past three-quarters of a century Hunters Point has been the location of large graving docks (among the largest, if not the largest, commercially operated graving docks in the United States). This site has been through the years, and is today, a haven for heavily damaged large vessels that could find cure for their hurts at no other location on the Pacific Coast.

When Bethlehem Steel took over the shipyards of the Nixon combine, including the old Union Iron Works, San Francisco, that firm began to negotiate for the purchase of the dock properties at Hunters Point. At that time there were two graving docks: No. 1, about 460 feet long; and No. 2, 750 feet long by 81 feet wide. After acquiring the property, Beth-

Hunters Point about 1902. This is the third dock there, with U.S.S. Ohio shown in drydock.



DRYDOCKS HUNTERS POINT

lehem negotiated an arrangement with the U. S. Navy whereby the Navy guaranteed to Bethlehem a minimum number of dockings per year, provided Bethlehem would build a larger dock and give the Navy first call on the new facility. This dock, the present No. 3, was built replacing No. 1 and was opened for vessels shortly prior to World War I. At that time, and up to the war just ended, it was the largest commercially operated dock in the United States and the only such dock capable of docking the world's largest ships.

In this basin were docked, prewar, such great vessels as the USS Saratoga, the Empress of Britain, the USS Lexington, and practically every battleship that visited the port of San Francisco.

On November 23, 1940, the Navy acquired Hunters Point by purchase from Bethlehem, and leased it to Bethlehem for operation, the lease being revokable at any time. The property thus acquired consisted of 48 acres and included the docks No. 2 and No. 3, described above, together with their pumping and other operating facilities and a few small buildings.

While the property was still operating under the lease, the Navy commenced construction of an assembly building (since converted to the present Inside Machine Shop), and the installation of 1000 feet of quaywall, the latter beginning on August 1, 1941. Limited machine tools were provided to stock the assembly building. The tools were those normally required for the effecting of underwater repairs. Early in December of the same year, additional facilities were begun. This included construction of an administration building, dispensary, paint and oil storehouse, workhouse, a service building, a guardhouse, transportation shop and garage, and a lunchroom and galley.

Expansion

After the Pearl Harbor attack, the Navy, on December 18, 1941, took over the property and immediately began a huge program of expansion. Operations commenced with a total working force of 59 civilian and five naval officers (representatives of the Industrial Department of Mare Island Navy Yard), and a representative of the captains of the yard's office, Mare Island. The Navy decided to build up Hunters Point with facilities for complete overhaul and repairs for all classes of naval vessels.

Hunters Point about 1920.





Hunters Point, March, 1942.

On February 18, 1942, two months to the day after the Navy assumed possession and operation, the new expansion program received approval.

The first step in the expansion took the form of an actual increase in physical size by the acquisition of 240 acres of property, nearly half of which was under water. Extensive heavy excavation and construction of waterfront facilities began that to date have totaled in excess of $23,000,000. The entire tip of the 290-foot-high Point Avisidero, a familiar landmark of San Francisco Bay, was removed to practically water level. This required the moving of almost 5,000,000 cubic yards of earth, which was put to use as fill in making usable land out of the underwater area mentioned above and additional underwater area acquired in later purchases.

Two thousand feet of quaywall and two 1000-foot piers were included in the waterfront facilities. A major item in this expansion was the construction of an 1100-foot-long drydock, located in the leveled land, replacing the tip of Point Avisidero. On June 19, 1943, only 10½ months after ground was broken for it, this drydock was the scene of the docking of the 26,000-ton former luxury liner Monterey. The dock, 1100 feet in length and 140 feet wide at the bottom, is capable of docking any ship in the world. The contracts for the construction of buildings at this activity to date totaled in excess of $15,000,000, varying from the $1200 small pier offices to the 89,000 square foot administration building, costing $400,000.

Submarine Repair

On January 26, 1943, the Navy Department decided that Hunters Point was the logical location for additional submarine repair facilities needed on the Pacific Coast and gave approval to the construction of such facilities.

A second acquisition of land had been made, consisting of 187 acres to the south of the previous acquisition and 60 acres to the north, bringing the total land area of the yard to about 540 acres, of which approximately 100 are still under water.

Three 400-foot finger piers were built in the submarine repair area, each capable of berthing two submarines on either side. The first of these piers was placed in operation less than four months after they were started.

Also incorporated in the submarine repair area were three graving drydocks intended primarily for the drydocking of submarines and destroyers. Two of the three 420-foot-long drydocks are 60 feet wide and the other 75 feet wide. The 75-foot width permits the use of this drydock in docking ships of the size of a C-1 merchant vessel. This expansion added another $6,000,000 to the investment at Hunters Point.

Administration

During all of this tremendous expansion Hunters Point, from an administrative viewpoint, has been, and is today, an annex of the Mare Island Navy Yard, forty miles away at the upper end of San Francisco Bay, near Vallejo, California. Gradually, as the project grew in size and importance,



Hunters Point, July, 1945.



Left: U. S. S. Hornet in new docks for repairs from typhoon damage.

Center: U. S. S. Saratoga in the big new dock.

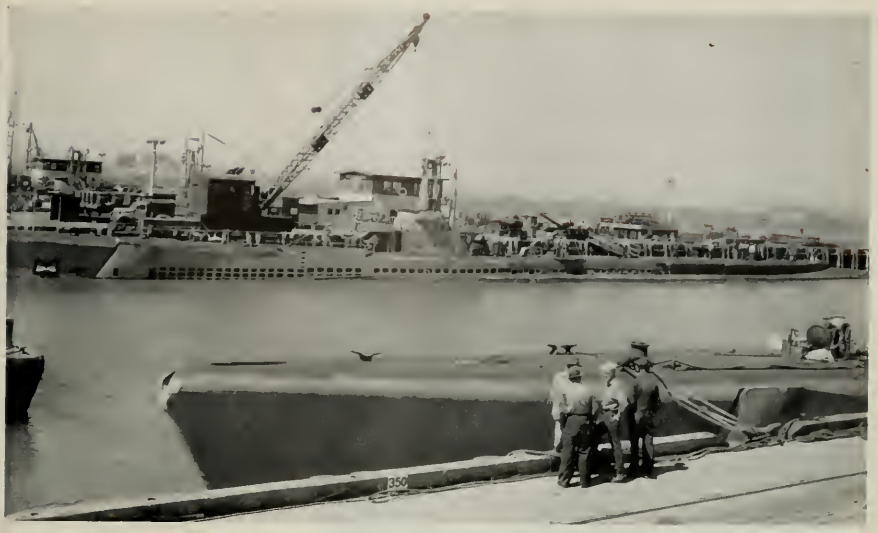
Bottom: Three flat tops in for repairs. Left to right are U. S. S. Hornet, U. S. S. Altamaha and U. S. S. Breton.



Hunters Point has become more self-contained and more self-supporting. The facilities as now completed can accomplish economically all work incident to the complete overhaul, or most extensive repair, of combatant vessels of any type or size now afloat.

In fact, during all of this expansion, work on such overhauls and repair jobs has progressed concurrently with the enlargement and outfitting job. Trucks hauling in machine tools, equipment and material were constantly passing or meeting trucks moving dirt. The original 59 civilian employees, as of March, 1942, had increased to 2000 on January 1, 1943, and on V-J Day had grown to 18,379, with a naval personnel of 829.

As of V-J Day another expansion program was in progress and will probably be completed. This program calls for an addition to the investment of $11,300,000, bringing the total investment to over $65,000,000. Foremost among the items under construction is the installation of a 450-ton lifting capacity, fixed bridge crane, and the mole on which it is to be erected. This crane will be used for re-gunning purposes and for turret overhaul. When completed it will be the heaviest weight-handling facility in the world. Also included in the items under construction are: additions to existing shops; additional



Submarines in outfitting basin. San Francisco Bay Bridge in background.

weight-handling facilities on the waterfront; and the construction and equipping of a diesel engine repair and overhaul shop.

World's Largest Crane

The world's largest crane mentioned above consists of two bridge crane trolleys, each capable of lifting 250 short tons. These crane trolleys travel on rails 182 feet above mean high water, the rails on each side being supported by a 730-foot long bridge spanning a pier 405 feet wide. The fixed cantilever arms at each end of the runways project 162.5 feet over the water at each side of the pier. Each runway is supported on two towers, 35 feet by 50 feet at their bases, and 320 feet apart. The runways are 142 feet apart.

For weights in excess of 250 tons provision is made for working the trolleys in tandem, giving a combined rated hoist capacity of 450 long tons or approximately 500 short tons. Specifications call for a total structure of sufficient strength and rigidity to carry the concentrated weight of both bridges and trolleys, plus the 500-ton lift with the vertical center line of the total load 96 feet beyond the outer edge of supporting towers and 78.5 feet beyond the edge of the supporting mole. In single bridge operation the center line of the 225-ton lift must be carried out 130½ feet over the water. The main hook has a vertical travel of 185 feet from 25 feet below water to 160 feet above water.

Housing

Along with the expansion of facilities in the Hunters Point Naval Dry Docks plant there has gone, of necessity, a tremendous housing project, and in the areas surrounding the plant there have been constructed new accommodations to take care of a population of 20,000. People from all over the United States have been recruited for the work and the ma-

Four landing craft in one of the small docks.





The top picture shows emergency repairs on U. S. S. Intrepid—patch on hull and jury rudder rig. The lower shows the ship with patch partially removed showing holed bilge.

jority of them live in these new, more or less temporary barracks.

In the plant itself there is a very considerable housing accommodation for the officers and crews of vessels laid up for repairs.

Repair Work

It would be impossible in the space allowed to detail the tremendous volume of work done at the Naval Drydocks. Here is a brief summary:

A total of almost 7,000,000 man-days was spent in repairing or overhauling warships to maintain maximum combat strength on the fighting line. Repairs in some instances involved construction of major sections of a ship, and overhauls almost invariably required extensive work because of a vessel's long periods in the forward areas before a yard "availability." In addition to repair and overhaul, a number of special jobs were performed for the installation of special equipment or for minor conversions.

Hunters Point was a haven for ships that had taken part in all the celebrated battles of the war. Its men and women mended the battle-wounds of some of the Navy's most famous fighting ships. The carrier Intrepid came to Hunters Point four times, on three occasions for repair of battle damage. Following torpedoing at Truk during the Marshalls campaign, the Intrepid limped back to the United States with a jury rudder and smashed stern plating for the biggest repair job Hunters Point had handled up until that time. The famous Saratoga, one of the three surviving pre-war carriers, was provided with additional guns and special equipment. Typhoon damage to the flight deck of the Hornet was repaired. At different times during the war, the men and women of Hunters Point worked on the super-battleships Iowa and Missouri and the pre-Pearl Harbor battleships Idaho, Colorado, Tennessee and Pennsylvania. The work on the Pennsylvania, extending from March 15 through June 18, involved some 200,000 man-days that were devoted to a complete overhaul, the regunning of the main battery and the modernization of the vessel's main and secondary fire control systems. This was the biggest job in the naval drydock's history.

Five light carriers and four escort carriers were given "availability" at Hunters Point — the Independence and the Belleau Wood for the repair of battle damage.

The Navy's hard-working destroyers, which bore the brunt both of Kamikaze flyers and Pacific typhoons, were well represented at the Naval Drydocks. Forty-three destroyers came to the "Point," 19 for battle or storm repairs.

More than a dozen other types of vessels were accommodated, including transports, tankers and landing craft. Thirty-five submarines that had prowled through Japanese waters and taken a heavy toll of enemy ships came to Hunters Point for reconditioning. Several of the "pigboats" had been heavily depth-charged and required extensive hull and machinery repairs.

Today the Navy has at Hunters Point a well-appointed ship repair and overhaul plant of tremendous

capacity. Its six docks have a combined capacity greater than the entire graving dock capacity of the Pacific Coast pre-war. Its No. 4 dock will accommodate any ship afloat, either mercantile or naval, and its No. 3 dock will take all such ships with one or two exceptions.

Manning this activity is an experienced trained personnel, both in the naval officer and in the civilian grades, that has done a very remarkable job both in the expansion of the plant and in the handling of naval repairs.

Hunters Point is therefore a decided asset to the Navy in time of peace as in war. Developing history demands a big U. S. Navy on the Pacific Ocean. A big Navy needs adequate repair facilities, and Hunters Point fills that need.

Along with other American repair yards, the U. S. Naval Drydocks, Hunters Point, helped sink the Jap Navy and defeat the Kamikaze campaign by keeping the fleet in top fighting trim. Its men and women are proud of the part they played in America's decisive victory.



Right: Outfitting dock with cranes.

●

Below: The two original docks, huge machine shop and parking lot.





S. S. California State.

California Maritime Academy

DURING THE TREMENDOUS training program of the United States Maritime Service the importance of the State Maritime Academy services has been somewhat obscured by the flood of publicity attending the larger effort. However, these older and more conservative institutions have been functioning consistently and graduating carefully trained officers for the merchant marine.

California Maritime Academy.



The California Maritime Academy was established by legislation enacted in 1929 for the purpose of training young men for service as officers in the United States Merchant Marine. At the present time, the length of the course is two years and graduates are awarded licenses as Third Mates or Third Assistant Engineers, a commission as Ensign in the United States Maritime Service, and a commission as Ensign in the United States Naval Reserve. For new incoming classes, the length of the course will be three years, and graduates will be awarded a Bachelor of Science Degree and will probably receive a license as Second Mate or Second Assistant Engineer instead of Third Mate or Third Assistant Engineer, in addition to their commissions in the United States Naval Reserve and United States Maritime Service.

The C.M.A. is a unit of the State Department of Education and derives its financial support from both State and Federal sources. A Board of Governors, composed of five members, four appointed by the Governor of the State of California, and the fifth being the State Superintendent of Public Instruction, is charged with the general operation, management and control of the institution.

The active and immediate management and operation of the Academy is vested in the Superintendent, Captain Claude B. Mayo, U. S. Navy (ret.), who is appointed by the Board of Governors with the approval of the United States Navy Department. Instructors have been selected by Captain Mayo and the United States Navy for qualities of practical experience and training in their specialties, their ability to impart their knowledge to the students, and their personality, including the ability to deal with young men without friction.

The first class in the California Maritime Academy entered in March, 1931, and graduated in August, 1933. With the exception of 1936 and 1937, when reduced appropriations forced restriction, there has been a fine class graduating every year. During the war years the program was stepped up and three classes were graduated in 1942, two in 1943, and two in 1944. The grand total since the inception amounts to 588 midshipmen, 263 from the engineer department and 325 from deck department.

The record of accomplishment in any school is best measured by the progress of its graduates. Of the 588 graduates mentioned above practically every one, with the exception of those who gave their lives in the service of their country, is still an officer in the merchant marine. Over 60 of these now hold masters' licenses, 95 or more are chief mates,





Top of page, back row, left to right: Lieutenants T. L. Dunlap, G. L. Davis, H. M. Bennett, H. M. Pedersen, S. P. Norman and Mr. D. Warick. Front row, left to right: Lieutenants J. F. Summerill and George E. Brockett, Comdr. Lester Martin, Capt. C. B. Mayo, Lieut. Comdr. C. H. Tubbs and Lieut. R. D. Heron.

Center: Standing are Capt. J. E. Brenner, Capt. Henry Blackstone, and L. E. Gibson. Sitting are Dr. Joel A. Burkman and Ralph D. Sweeney.

Mess hall.

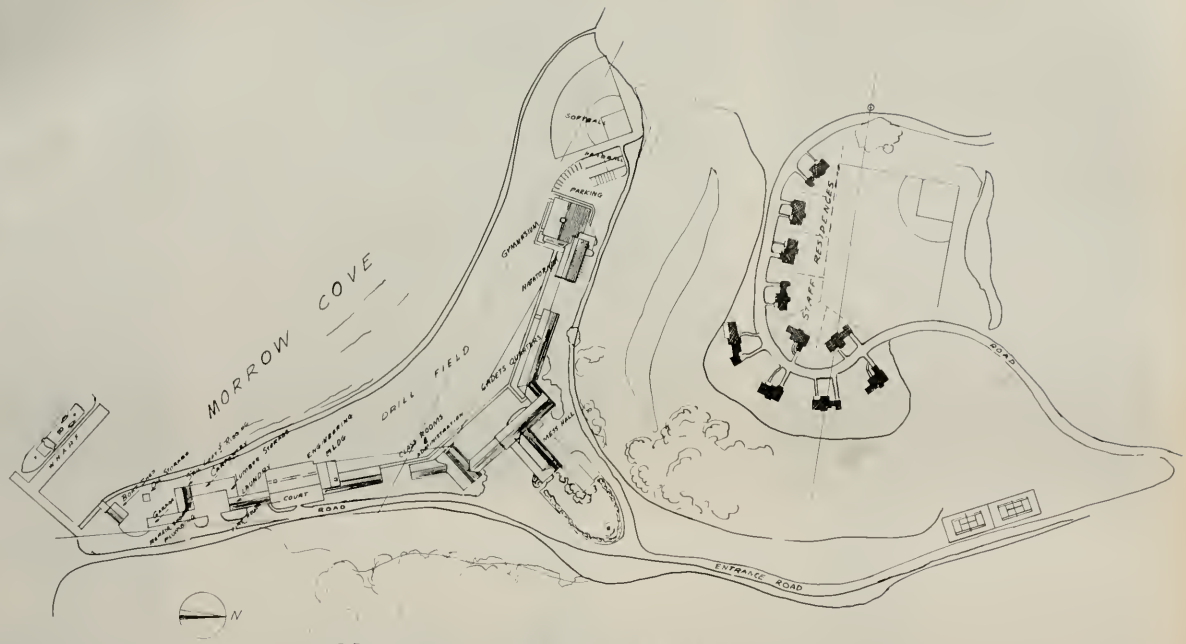


Barracks.



Administration Building.





MASTER DEVELOPMENT PLAN

California Maritime Academy, Morrow Cove, California.

over 50 are chief engineers, approximately 75 are first assistant engineers, and the balance are second or third mates or assistant engineers. One graduate won his master's papers at the age of 22, and another his chief engineer's license at the age of 21. This seems to us abundant proof that the course given at C.M.A. fits the graduate not only for his first license as a deck or engineer officer, but also for rapid advancement at sea and ashore.

Since August, 1943, the C.M.A. has had its shoreside location at Morrow Cove, Carquinez Straits, San Francisco Bay, where the State of California had acquired 67 acres of land for that purpose. The State Legislature appropriated approximately $2,000,000 for the construction of a permanent shore establishment at this site. Some $500,000 of this two million has already been expended for docks, fills, cuts, and temporary buildings. A gymnasium, a natatorium, an armory, and five staff residences are now under construction, at a total cost of $285,000.

Program for future construction includes: seamanship building, boat shed, and sail loft, $62,000; engineering building and power house, $147,000; classroom and administration building, $139,000; mess hall, $92,000; and cadet quarters, $300,000.

This permanent building program was begun in September with the laying of a cornerstone for the gymnasium.

Morrow Cove is in many ways an ideal site for the academy, and the architect has taken full advantage of the natural beauty of this location. One of the principal state highways borders the campus at its rear and the buildings and docks front on the deep salt water of Carquinez Straits. A short distance away on one side is Vallejo and the great Mare Island Navy Yard, and on the other the great cantilever bridge which carries the highway across the straits. At the south approach to this bridge lies the town of Crockett, built around the largest cane sugar refinery in the United States, and along the south shore of the straits and the adjacent waters are some of the largest oil refineries and chemical plants in the State.

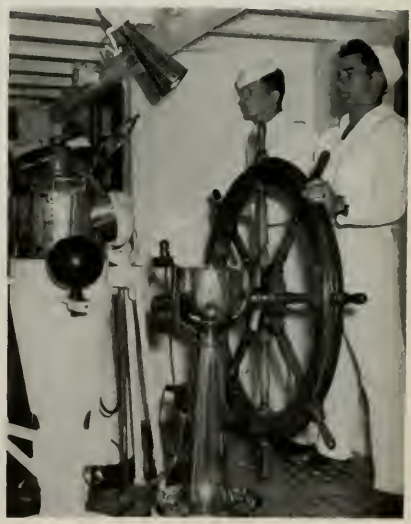
Frequent excursions to Bay Area industrial plants are part of the curriculum, so that the midshipmen get first hand contact with many of the sources of future ship business and with shipbuilding and ship repair.

A school ship, S.S. California State, is an integral part of the academy. During intervals between cruises she is berthed at the academy dock. Here the midshipmen stand watch and do repair and maintenance work. Steam is kept up and the vessel is continually in use for demonstration and even classroom purposes. When cruising, the midshipmen form the crew of the vessel and put into practice the lessons they have learned in the classrooms.

For the duration of the war cruises were limited to San Francisco Bay. Prior to the war S.S. California State sailed on very ambitious cruises, including circumnavigation of the world; round South America; Hawaii, New Zealand and Australia; and intercoastal to the Atlantic ports of the United States. Such cruises will now be resumed.

In July, 1940, the State Academies were all transferred from the Navy Department to the Maritime Commission and that body now has associated responsibility for their support and guidance.





Above: Cadets at engine controls, S. S. California State.

Right: Cadets steering in wheelhouse, S. S. California State.



At a South Sea island, a Cleveland Class U. S. cruiser undergoes repairs in an ABSD. on duty in less time than it would have taken them to steam back to a major base.

ADVANCED BASE SECTIONAL DOCKS

KEEP NAVAL COMBAT UNITS EFFECTIVE FAR FROM BASE

(All photos Official U. S. Navy Photographs.)



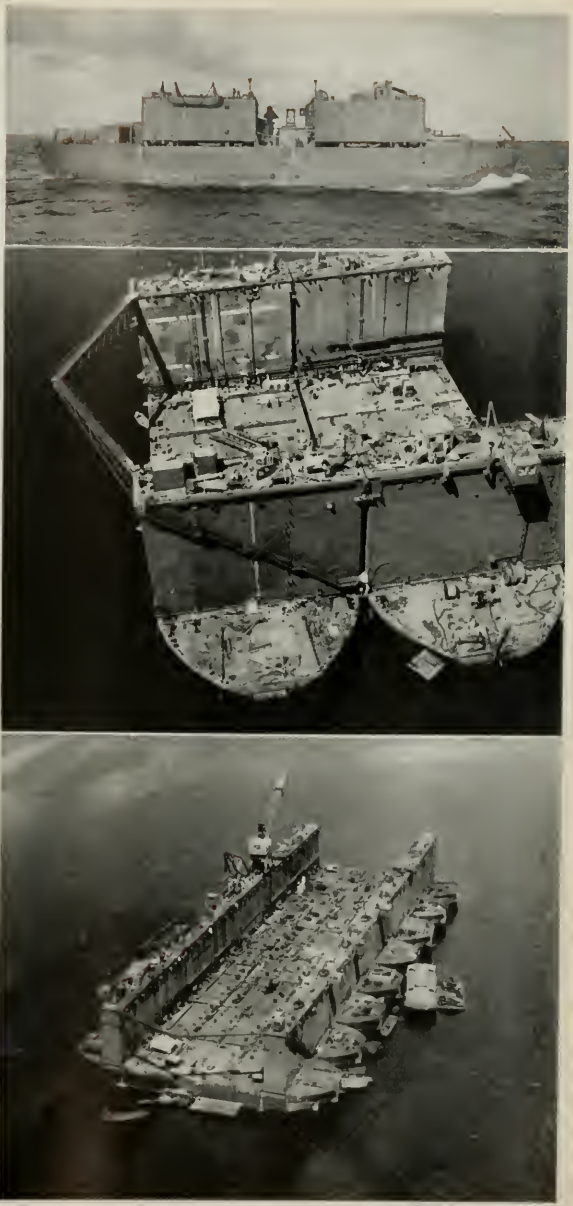
The ABSD gongs work night and day.

A GREAT DEAL of talk in connection with this war, particularly in the Pacific Ocean theater, has centered around the word "logistics." The U. S. Navy has always been concerned with the implications of this word. A combatant ship 5000 to 7000 miles from her home base is very vulnerable under war conditions if left to her own resources. Fuel, water, ammunition, food, personnel replacements are all very necessary after an engagement with the enemy and are all more or less practically impossible short of a home base. The obvious remedy is to establish the equivalent of a home base as close to the fighting front as possible, and that is just what the U. S. Navy did on a scale never before attempted in the history of naval warfare.

Great secrecy has kept this story under wraps until after V-J Day, but now much of it is released and it explains the tremendous program of auxiliary shipbuilding carried on by the Navy for the past 3½ years.

After the long bombardment of Leyte by the U. S. Navy task forces, the Jap Navy apparently figured that the U. S. fleet would be out of ammunition and other supplies. So the Japs moved out of their home waters for a counter blow only to find these task forces completely ready for fight. They had all been completely serviced in a few days' time by an advance base only a short distance from Leyte. Many Jap fighting ships were destroyed on that occasion because they failed to understand the work of the advanced base technique. The same thing happened again after Iwo Jima.

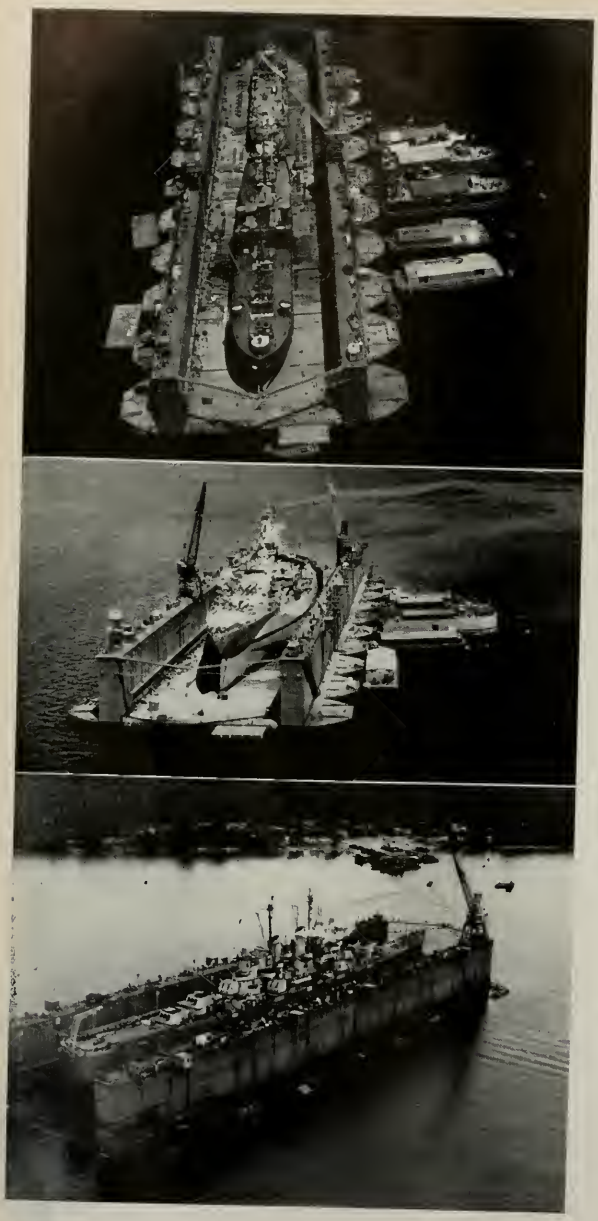
An advance base is composed of a fleet of auxiliary ships known as a Service Squadron. Such a floating base includes vessels of many types: specialty repair ships, floating drydocks of several types, concrete floating warehouses, cargo vessels, refrigerated hulls, tankers, landing barges and other types used as water taxis, and many others. The largest of these Service Squadrons comprised several hundred ships of all types and was able in a comparatively few hours to replenish the battle, sus-



Top of page: Section of an ABSD as towed by Liberty steamers. Side walls are down on the dock floor and have the appearance of tanks.

Center: On arriving at an advanced base, sections are joined to form the huge ABSD. Here is a bird's-eye view of two such sections.

Bottom: Here are eight sections of ABSD securely joined.



tenance, and fuel supplies of an entire task force including: 600,000,000 gallons of fuel oil; 1500 carloads of ammunition; great quantities of fresh, frozen, and dried food; and medical supplies enough for two months for a large city. An article in the July issue told about the Oakland Naval Supply Base and its shipment for fleet issue. These Service Squadrons are the other end of that supply line.

The organization work in connection with these bases is perhaps unparalleled. Certainly its successful functioning has been back of every piece of brilliant naval strategy in the Pacific, and to it goes much of the credit for the wonderful achievements of the U. S. Navy in that theater.

Floating docks are one type of floating equipment that forms a very important item in the advanced base technique. Principal and largest unit of this type is the A.B.S.D. or Advanced Base Sectional Drydock. This dock is made up of sections each of which has a lifting capacity of from 8000 to 10,000 tons. As shown in the illustrations, each pontoon is made up of a more or less ship-shaped pontoon float on which are erected, thwartship of its length, two cellular structures forming the walls of the dock. For purposes of towing, the wall structures are fastened to the dock in such fashion that they can be folded to lie flat on the deck of the pontoon, thus presenting less surface to the wind and water resistance in towing. The sides of the pontoon and the ends of the walls are designed to be linked rigidly to the sides and ends of identical structures. After towing of sections to the advanced base sites, these sections are joined together in groups of 7 or 10 to form complete drydocks. Each section is equipped with pumps of great capacity for flooding or dewatering the dock.

These docks as assembled in 10 sections, of 10,000 tons capacity per section, are the largest of their type, being capable of lifting any ship afloat. They handle our largest battleships, or two light cruisers, with the "greatest of ease." These are called the "battleship" type. Sections of 8000-ton capacity, assembled in

Top of page: The complete (largest size) ten-section dock with two ships up and room to spare.

Center: A battleship up in a ten-section ABSD.

Bottom: An eight-section dock with a large cruiser up.



Bow view of ABSD with a dock and a tug up for repairs.

Floating drydock beam ended to allow passage through Panama Canal locks.





A floating dock being towed on beam end through the Panama Canal.

the seven section type, have a total lifting capacity of 56,000 tons and are called cruiser type.

In forming these docks the sections are welded together rigidly by the use of heavy splice plates at the top and bottom of the wing wall structures. An interesting item is the self-docking feature. The wing walls are complete in themselves and are bolted to the pontoons. The pontoons are not welded together in assembling the sections. By unbolting any pontoon from its side walls it can be sunk a little, slid out from its position and drydocked on the rest of the dock for any repairs or cleaning and painting.

The electrical equipment is quite extensive. Each section carries a complete power plant consisting of two 438-kva diesel engine electric generating sets with direct connected exciter; together with suitable switchboard for power and light distribution. The following description is from a General Electric release describing their equipment as installed in A.B.S.D.'s.

Motor operated valves and two powerful pumps operated by 200-hp vertical squirrel cage motors control the watering or dewatering of each dock section to submerge or float the dock. Capstans driven by 30-hp motors warp the damaged vessels into position on the dock.

Remote operated level indicators in a control house, showing the level of the water in the various ballast chambers, assist the dock master to direct these operations over an intercommunicating system to operators stationed at control panels in each section.

The docks are equipped to supply the vessel under repair with both a-c and d-c service. A-c is derived from a bus fed by generators rated 438 kva, two of which with the necessary switchgear and related equipment are located in each section. The d-c service is obtained from a 300-kw, 250/125-volt, three-wire sealed ignitron rectifier. The power generating equipment is unique in that it is designed so that when a ten-section dock is used for repairing a battleship, thus requiring all twenty 438-kva generators to be operated in parallel, current-limiting reactors are connected in circuit to limit short-circuit currents.

In addition to the major electric equipment, each section is equipped with one 1-hp and three 5-hp fresh water pump motors with full voltage starters; one 7½-hp salt water circulating pump motor; one 3-hp ventilating fan motor; and a number of other motors of various sizes for refrigerating, compressor, anchor windlass, sewage disposal, and fire-fighting purposes. Each dock also has two electrically driven revolving jib cranes, both of which are protected by crane-stability gages.

Other than being selected with the view of meeting the rigorous conditions imposed by drydock service, much of the electric equipment is, but for minor modifications, of standard design. The metal enclosed switchgear for controlling the generators, however, was custom-made for the application, with the power output connected to a specially designed distributing system. Also, the 10-, 25-, and 50-kva transformers for ship service, lighting, and heating circuits, respectively, as well as the 300-kw rectifiers for supplying d-c service, were required to be designed to withstand mechanically the 90-degree tilting of the wing walls of the docks. This tilting takes place when the wing walls are folded flat to the decks of the sections, as described above.

A crew of 40 men is required to operate one of these docks, and the structure is equipped with hotel accommodations to take care of this crew. There are facilities carried to cover most repair work and the maintenance of the dock itself, so that the structure is a combined self-contained floating ship repair unit and limited first class hotel.

The battle damage repair jobs done in A.B.S.D.'s range from overhaul or bottom painting jobs to heavy hull damage. One such job required 250 tons of new hull plate. On docks of this size the largest of combat vessels are berthed with ample working space and ample spare buoyancy available to take care of any type of repair or overhaul. Since the docks operate in conjunction with advance bases or service squadrons there are always available such necessities as: spare parts, fittings and provisions in the supply ships; machine tools, forges and foundries in the specialty repair ships; diesel oil, fuel oil, lubricants and distillates in the tankers; and stores of all types in the floating warehouses.

To use the picturesque phrase of Vice Admiral Ben Morrell, the A.B.S.D. is to the Navy what the field hospital is to the Army. It keeps the fighting units of the fleet in condition to continue fighting. In this war, for the first time in history, naval bombardments of shore emplacements and of enemy shore forces have lasted continuously for weeks and even months. Supply ships from the service squadron form rendezvous



Concrete auxiliary repair dock being towed at sea.

squadrons a short distance from the fighting fleet and reload combatant units with everything required, being themselves reloaded by new vessels from the service squadron. Such vessels escort or tow damaged combat units back to the A.B.S.D. for surgical operations.

The dramatic sudden ending of the war was attributed largely to the spectacular atomic bombing of two Jap cities. However, it was the softening of Japan, the destruction of her navy and merchant marine, and the capture of her Pacific island bases that prepared the way and put American forces within the easy bombing range that made atomic attack possible. All of these preliminary conquests were made possible largely by the work of thousands of organizing minds who worked out the designs of special types of vessels, the loading and replenishing schedules for those vessels, and the reconditioning and repair equipment necessary to keep those vessels, and the fighting units that they served, in the right spot, at the right time, ready to work.

The A.B.S.D. is the largest of such units and possibly the most complicated and most ingenious unit of the group. The cost has been tremendous, but the results are such an increase in the efficiency and effectiveness of the Task Force units of the U. S. Navy that this cost seems entirely justified.

In the minds of our naval officers there is "no doubt that in the future the A.B.S.D. will play a vital role in naval warfare through saving of battle damaged ships and keeping all others at the peak of fighting trim."

Dock floating U.S.S. Peto, a ship built at Manitowoc, Wisconsin, down the Mississippi to the sea at New Orleans.



Bethlehem Repairs U.S.S. Mazama

IN RECORD TIME

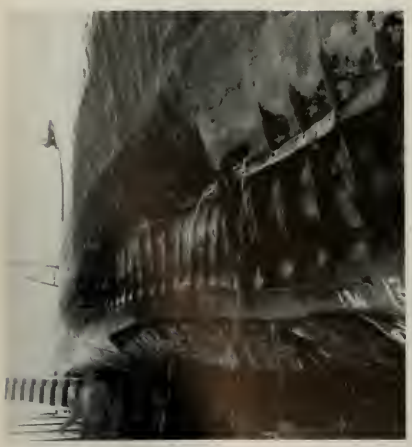
IN THE EARLY DAYS of this year the U.S.S. Mazama, a C-2 type vessel (converted to an ammunition carrier while in course of construction in a Tampa, Florida, yard), was lying at anchor with some other naval vessels in a South Pacific port when an external underwater explosion of terrific force occurred on her port bow. The force of this explosion was so great that the fore end of the ship seemed to leap into the air, causing her to whip in such a manner that the hull structure knuckled in the vicinity of frame 100.

Since it was not convenient to drydock the vessel at an advance repair base, an emergency underwater survey was made by divers, and temporary repairs were effected before the vessel was allowed to proceed to San Francisco, under her own power, for complete repairs. The temporary repairs consisted of the installation of a fore and aft cofferdam in No. 1 hold space forward, which sealed off this space from the sea, leaving the deep tanks adjacent open to the sea.

On arrival in San Francisco Bay the vessel proceeded to Mare Island, but on the assignment of the repair job to the Bethlehem San Francisco Yard a group of men from that plant surveyed the damage and obtained working drawings and offsets from the ship. The following day Bethlehem's loftsmen commenced work on the lines and templates for the replacement of the damaged steelwork, which consisted of quite a considerable area of the outer bottom and lower side shell plating, inner bottom top plating, and inner bottom floors. It was found that the center vertical keel was driven upward 1½" for a longitudinal distance of 40 feet, which in turn forced the vertical hold stanchions, and the supporting deck girders above, and moved the decks out of line. During the week that the vessel was at the Mare Island Yard all the templates were made and all the steel ordered for the damaged shell plating, shell frames, floors, inner bottom and decks, so that on the vessel's arrival in the Bethlehem yard the men were ready to go to work without delay.

Work actually started when the ship was drydocked on April 16 and the men commenced the removal of the damaged structural steel work on the port side, which included a length of about 110 feet of the outer bottom shell plating and framing up to the second deck, and a length of 80 feet of the inner bottom plating and the attached floor plates. Due to this removal of such a large portion of the main structure of the vessel, considerable difficulty was encountered in keeping the structure in alignment. However, this was overcome by the installation of numerous adjusting jacks and long vertical shores, 14" x 14" in section, extending from the bottom of the drydock to the second deck. Throughout the burning-out process the fabrication of all the necessary new structural steel work was going on in the plate shop. A noteworthy feature of the job was the close cooperation between the shipfitters and the shipwrights during the removal of the damaged structural work, and more especially during the installation of the new material, all of which contributed greatly to the successful handling of the very difficult problem of the alignment of the ship.

The exceptional strength and ample working space afforded by the yard's 21,000-ton drydock made possible the cutting away of the damaged area of the shell without interruptions which are normally required for the installation of supports. By supporting the damaged part of the vessel from the second deck with vertical shores, all of the load on the portion of shell to be cut away was taken by the drydock.



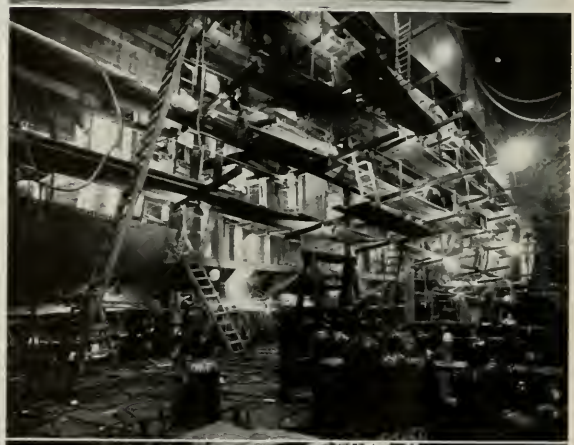
A close-up showing a detailed view of distortion of the shell-plate by the explosion. There was no hole blown in the ship's shell.

One of the major alterations to the ship required to be completed at this time was the installation of a series of fore and aft torpedo cofferdam bulkheads, located four feet in from shell at line of inner bottom. These were erected as a torpedo protection: four in No. 2 hold deep tanks, two on the port side, two on the starboard, and a similar arrangement in No. 4 hold deep tanks. These deep tanks have a depth of about 22 feet, and an additional first platform deck was fitted in each. In order to facilitate the handling of ammunition three elevators and eight skip hoists — one hoist to each deep tank, extending from the tank top to the main deck— were also installed.

Due to the necessity for transferring cargo to another vessel when both vessels are under way, the complete rigging arrangement was redesigned and altered, which necessitated the rearrangement of winches, fairleads and blocks, and the fitting of aerial transfer lines. Miscellaneous damage resulting from the underwater explosion, which had to be renewed, consisted of fiber glass insulation of the hull in No. 1 and No. 2 holds: all wood decking in way of damage to tank top; replacements and additions to the fire extinguishing piping systems; and repair of considerable miscellaneous piping damage.

At this time the Navy also desired a series of standard alterations, consisting of complete new gun changes and extensive overhaul and modification to the radio and radar installations, for which the allotted time is 42 days on a vessel of this size and type. The total cost of the damage repairs, the numerous alterations and overhauls, amounted to over one million dollars. The time involved in the completion of the whole job was exactly 42 days, a very remarkable achievement in itself, apart from the extraordinary difficulties involved throughout the operations.







Top of page: Looking aft along No. 1 and No. 2 holds, showing line of tank top which helped in resisting the force of the explosion. Cofferdam was built inside the shell at this location.

●

Center: Port underwater body of the vessel with shell plates of No. 1 and No. 2 hold partially removed from the bottom of bilge to the waterline.

●

Bottom: The particularly heavy shoring from the floor of the drydock to the underside of the second deck.



General view of the new Westinghouse Pacific Coast High Frequency Laboratory.

New High Frequency Laboratory in the West

A new laboratory to which all Western industry may bring for study its problems of speeding peacetime production by making use of the newest scientific methods of high frequency heating was opened in Los Angeles September 13 by the Westinghouse Electric Corporation.

The Westinghouse Pacific Coast High Frequency Laboratory occupies spacious ground floor quarters at 420 S. San Pedro Street, the company's headquarters for the Los Angeles area. In charge of the laboratory is Dr. Russell A. Nielsen, formerly of the company's Research Laboratories at East Pittsburgh, Pa., assisted by a staff of engineers.

Methods of applying high frequency heating—literally heating objects or substances by radio waves—were demonstrated to Los Angeles area newspaper and magazine writers and editors by Dr. Nielsen, a native of Portland, Oregon, and his staff.

On a one-kilowatt demonstration generator, the visitors saw the high speed setting of glue, a process which is materially speeding the fabrication of plywoods and enabling the manufacture of thicker, stronger sections than were possible by earlier processes. The Thermosetting glue in the demonstration was set in less than one minute by the new process. As much as 24 hours may be required for setting by drying in air.

The engineers also demonstrated a five-kilowatt industrial radio frequency generator for dielectric heating—the heating of materials which are poor conductors or non-conductors of electricity. In this demonstration, small cylindrical pellets of thermosetting plastic were heated, then were stamped into ash trays on a nearby press. Pellets were brought to the required temperature in approximately 30 seconds by the new heating process, which reduces by 50 per cent or more the time required in heating and molding plastic preforms.

Also demonstrated was a 20-kilowatt industrial radio frequency generator for induction heating — the heating of materials, largely metals, which are good conductors of electricity. With this generator Dr. Nielsen showed the hardening of cutting edges of triangular steel mower blades, which were brought to the required temperature, 1600 degrees Fahrenheit, and passed into quenching oil at the rate of one completed blade every five seconds. The induction heating process hardened only the desired portions of the blades, the cutting edges, leaving the remainder strong and tough.

"The 'industrial magic' of radio frequency heating, either induction or dielectric, is miraculous on several counts," Dr. Nielsen told the visitors. "One, and most important of all, is that by this means heat can be established **inside** a material. Second, with metals, heat can be concentrated on or within some specially selected or localized portion and applied so quickly that the remainder of the metal stays cool. The interior of non-metals is heated as rapidly as the surface.

"In the third place, the phenomenon of internal heating occurs without any mechanical contact with the material. And fourth, the electric apparatus which is the cause of this heating may not even get warm."

The five-kilowatt dielectric heating generator in the laboratory operates at a frequency of either five or 30

megacycles—5,000,000 or 30,000,000 cyles. The 20-kilowatt induction heating generator operates at a frequency of 450 kilocycles, well below the familiar commercial broadcasting band.

Induction heating is being used today in many industries and its applications are growing rapidly, Dr. Nielsen reported. Among uses he listed as already established or possible are surface hardening of gears, shafts, tools and cylinders; brazing of parts in a production process; soldering of cans, bushings, etc.; heating for forging; melting of high quality metal alloys; annealing of metal tubing and sheet; heat treating of pipe welds, and many others.

Dielectric heating, he said, is being used or is technically possible—although in some instances still in the experimental stage—in such tasks as the softening of plastic preforms and other materials prior to molding; the bonding of plywoods, plastics and shatterproof glass; the curing of rubber and plastics; treating rayon and nylon; drying of food, wood and ceramics; sterilization of grain and package products, and many others.

Right: A high frequency oscillator coil.

Lower left: Dr. Russell A. Nielsen, in charge of the new laboratory, adjusts power level on a transformer in a 20-Kilowatt 450-kilocycle industrial radio frequency generator used in induction heating.

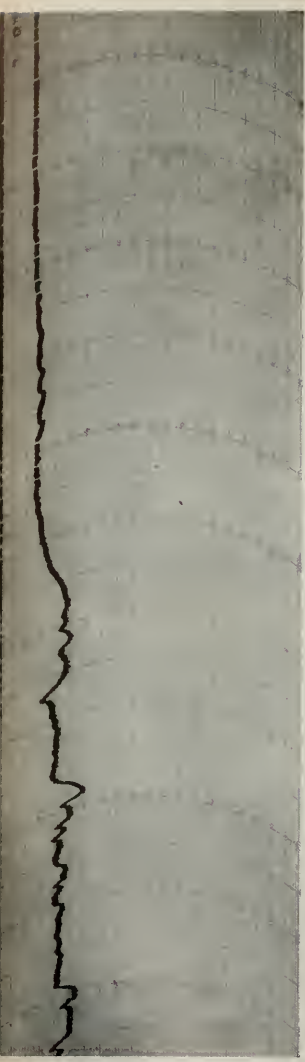
Lower right: R. K. Callins, Westinghouse engineer, inspecting a 10,000-watt (10-kilowatt) air-cooled radia tube.







Electronic Depth Recorder



Above: A typical record of the Bendix depth recorder.

Right: M. S. Victor Johnson, Bendix Marine Division seagoing research and testing laboratory, was used for testing the new electronic depth recorder.

A new and revolutionary electronic "depth recorder," which will help to make coastal navigation safer in fog and at night, and which might be termed the "fisherman's eye" because it can be used to locate fishing banks and schools of fish, has been tested at sea, and is now being put into production at Bendix - Marine division of Bendix Aviation Corporation.

This device, which bounces a high-frequency signal off the bottom of the sea to measure the depth of water, draws a permanent and accurate picture of the ocean floor on a chart.

The new depth recorder was developed during the latter part of the war, and has been held under wraps until victory over Japan would permit its being put into production. Bendix is rushing rearrangement of facilities for high-volume production of the depth recorder, as well as other new products developed for peacetime use, which will be announced as soon as they are put into production.

Hydrographic charts give channel depths and the depths of coastal waters. With one of these charts and a depth recorder, a ship can be navigated safely and easily in fog and at night.

The device is also expected to prove a boon to commercial fishing craft, since it accurately locates fishing banks and detects the presence of objects such as fish between the bottom of the sea and the surface of the water.

The principles of echo sounding—the art of measuring the depth of water by the time required for a signal to be sent to the bottom and return—were formulated more than 100 years ago, but it has not been until recent years that these principles have been applied in a practical, useful manner.

The new depth recorder consists of a signal sender, echo amplifier and a graphic recording mechanism. The signal sender sends a high-frequency signal which is caught on the rebound from the ocean floor and amplified by means of electronic tubes, and then recorded on a horizontally moving chart in the graph recorder. The result is a picture of the ocean floor over which the ship is passing.

By changing the speed of the graphic recorder readings can be obtained either in fathoms or in feet. When recording in feet, 288 soundings are taken per minute, or a sounding every 3½ feet when the ship is operating at a speed of 10 knots.

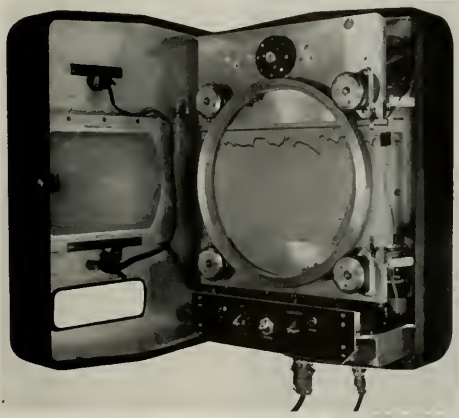
When recording in fathoms, 48 soundings per minute are made, or one every 21 feet at a speed of 10 knots. These soundings are recorded on the chart to provide an easily read profile of the ocean floor.

The device does not need a trained operator, and provides a permanent record of soundings for future reference.

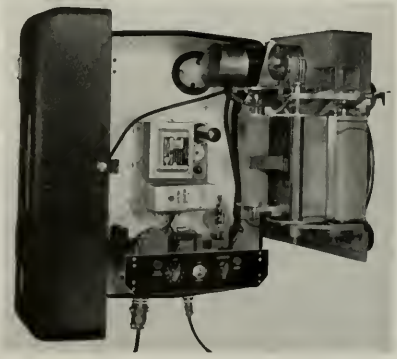




Right: Bendix-Marine recording depth finder. Left, signaling device; right, recording mechanism.



Left: Depth recorder with cover opened, showing paper operating mechanism.



Right: Bendix depth finder recorder opened to show details.

Oregonship Outfitting Dock Burns



Portland's most disastrous fire in history swept throughout the entire outfitting dock of the Oregon Shipbuilding Corporation on August 30 as flames started by an acetylene torch caused more than $3,000,000 damage to ships, dock, and shop equipment. The machine shop, sheet metal shop, marine store shop, and all equipment of the Buckler Chapman Co., shipjoiners, were completely destroyed, while seven ships being outfitted at the dock suffered damage in varying degrees.

Seven ships at the dock were at first feared lost as flames engulfed first the U.S.S. Bexar Victory and then spread to adjoining ships awaiting completion. However, firemen from shore and riverboats succeeded in limiting the extent of the damage to the seven ships, which were finally towed out into the Wilamette to safety. The shipways, adjacent to the dock, were also threatened, but heroic efforts on the part of all firefighters prevented the fire from spreading to them. The fire, which started just as the graveyard shift was leaving the plant, found about three thousand workers in the area. Many were forced to leap from the dock to the river, but only one worker, a cabin painter on a flaming ship, is known to have died. Kaiser authorities, in charge of the yard, stated that ships at the dock would be completed and that those on the ways would be launched in due time. Oregonship is producing ships again in the same spirit as always.

Top of page: A lone crane remains on Oregonship's outfitting dock while smoke and flames pour from ruined shops and from the pilings supporting the dock.

●

Center: A few minutes later the crane topples into the river.

●

Bottom: Ships awaiting completion at the dock being towed into the river, where damage to them was found to be comparatively slight.

Pacific WORLD TRADE
Reg. U. S. Pat. Off

By T. Douglas MacMullen



The Government Should Act Now

We must have world trade and we must have shipping.

World trade and shipping go together. Every move of Government and private interests that will encourage world trade will benefit the whole people, but while private interests bent on restoring trade and filling a void in the employment picture pursue every possibility for the revival that is so necessary and for which the present seems to be the brightest time in all history, many channels are obstructed by contrariness or languidness in Washington. It is in the public interest, and this includes every element of the public, that shipping and trade be restored **now.**

By contrariness we refer to the apparent determination of the Civil Aeronautics Board that steamship companies shall not develop their service by the addition of airlines.

By languidness, we refer to the slowness of Congress and others in Washington in developing a shipping policy for the United States and a ship sales program. Admiral Land of the Maritime Commission has made a great contribution in his action in defense of the coastwise and intercoastal steamship lines but there is more, much more, to be done. Charged with responsibility for the development of a successful merchant marine under the Merchant Marine Act of 1936, the Maritime Commission should insist, nay demand, that the other matters referred to above be resolved in the interest of the shipping industry.

The shipping industry, which unlike most industries of the country was completely diverted to 100% war activity, with its vessels and facilities taken completely under the control of the Government while its competitors flourished, is now being stopped in its tracks in its efforts to restore and modernize what is perhaps the world's most important industry. The Maritime Commission should make itself heard so loudly that the country will be aroused. The importance of shipping and export and import trade to every farmer, as well as industrial worker and city dweller, has never been sufficiently publicized. An almost impossible burden is being placed on the steamship companies and their friends in the effort to get this story across. Shipping companies **must** prosper. They are more important than the commercial airlines, for whom there is plenty of business at home, and whose nibbling at overseas traffic may be just sufficient to undermine the steamship operations. The steamship companies which assisted in the pioneering of overseas air service have been knocked completely out of the picture by another commission which seems to regard its duty to the airlines to be more important than its duty to the country.

But there are other things which the Government can do to facilitate the resumption of shipping. Congress must act on a ship sales bill, and here again the Maritime Commission should be fighting before the public for results. There are many avenues of publicity, the personnel of which seem anxious to delve into matters of international significance, which might better be used for constructive development of both international and national welfare.

As the British say, there is an awful lot of employment dependent on trade and shipping.

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"Now the Seas Bear Only Commerce."

—General MacArthur

Bright in the East



Shanghai, looking down Nanking Road (left) and Kiukiang Road (right).

The long war that has obstructed and delayed China's progress has served to build up a backlog of anticipation in America for the day when trade might be resumed and the cities of the Orient and the South Pacific be opened again to world shipping. No person concerned with shipping, no port city whose prosperity depends on shipping, no industry or agriculturist whose products are exported or who relies on imports for the creation of wealth and employment will fail to thrill with the knowledge that the progress of the East is now to be resumed.

Shanghai

As the largest commercial port in the Far East was reopened by American and British warships on September 19, a major trading opportunity was created for the Western world. This city of more than 3,000,000 population is the inlet and outlet for an area that contains half the people of China. Every former visitor to China knows the Shanghai Bund, the Nanking Road and the Bubbling Well Road. To ship operators and traders, as well as to most tourists, China means Shanghai.

The Shanghai Bund, looking south.



There is hardly a manufactured item of importance in the United States that has not appeared on ships' manifests to Shanghai. The largest single item of import in the past was cotton in one form or another, but in recent years the value of imported machinery has been rising steadily. Vehicles, electrical materials, lumber, coal, paper, tobacco, chemicals, iron and steel, copper and sugar are large items on a long list. American firms who seek a market in China will be watching the sailing schedules for Shanghai from now on.

And exports from Shanghai. Do you remember silk? In spite of all the talk of substitutes for this beautiful fabric, there will soon be 50,000,000 pairs of eyes watching the retail counters for silk — just silk. There will be tea again from China and rugs and hardwoods and tin and tungsten and antimony and matting. And firecrackers. The paint industry of America is crying for linseed oil, now very short in the market. Tung oil and other wood oils from China are substitutes for linseed and are superior in many ways. Tung oil will soon be flowing this way, as will a thousand products of industrious China when industrial America fills the orders now piling up for manufacturing equipment.

Hong Kong

Hong Kong is already reopened, and this great outpost of Empire is already resuming its historic position



Hong Kong, City of Victoria in foreground; Kowloon with its docks in the rear.

Pacific World Trade



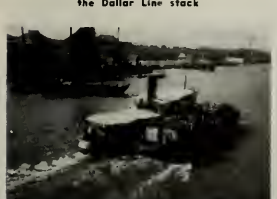
Shanghai transportation. Buses concede nothing to Fifth Avenue, but Fifth Avenue can't boast a rickshaw.

as a sort of service station for the East and the West.

Contrary to the opinions held by many people, the rights of the British in Hong Kong are as fixed and legal as are the rights of America in California. The Island of Hong Kong was **ceded** by China to Great Britain in 1841 and the mainland peninsula of Kowloon opposite Hong Kong was **ceded** in 1860. Frequent references to British leaseholds can refer only to certain other mainland territory beyond Kowloon, which leases extend for 99 years from 1898.

Hong Kong is not a city. It is the name of the Crown Colony which includes all of the above mentioned territory. The city on Hong Kong Island is Victoria. Kowloon is the seaport. When the British first occupied Hong Kong Island it was a practically barren hill tenanted chiefly by pirates. They have made it one of the beauty spots of the world, and its value to China as a protected free port for the import and export of world supplies, the financial, shipping and insurance center of Eastern Asia, is incomparably greater under British development than it would ever have been otherwise. More than 95% of the population is of Chinese origin, but a fact that is often overlooked is that most of the permanent Chinese residents of Hong Kong were born there and are British subjects.

The commuter problem in China. Note the Dollar Line stack



In a recent address before a Commonwealth Club section meeting in San Francisco, British Consul-General Cyril H. Cane reported that shipping in Hong Kong harbor had reached a high figure, exclusive of fishing craft, of 672,000 vessels in one year with a tonnage of 43½ million.

The influence of Hong Kong upon progress in China, said Mr. Cane, is best expressed by the words of the late Dr. Sun-Yat-Sen when he went to the Colony in 1923 and visited the University: "I feel as though I had returned home, because Hong Kong and its University are my intellectual birthplace. I have never before been able to answer the question properly, but now I feel I am in a position to answer it today. The question is, 'Where did I get my revo-



Yokohama. The President Hoover off the Yokohama Bund.

lutionary and modern ideas from?' The answer is, 'I got them in this very place, in the Colony of Hong Kong.' I compared Heungshan (his birthplace) with Hong Kong, and although they are only fifty miles apart, the difference of the government oppressed me very much. Afterwards I saw the outside world, and I began to wonder how it was the foreigners could do so much as they had done, for example, with the barren rock of Hong Kong within seventy or eighty years, while in four thousand years China had no place like Hong Kong. . . . Then the idea came into my head. Why cannot we do the same thing in China? We must imitate the same thing. We must change the Government before

GOOD NEWS

As Grace, Matson, Moore-McCormack, American President Lines and others began publishing their sailing schedules, plans of tourists and traders took a bound.

MATSON NAVIGATION COMPANY

—— Agents for War Shipping Administration ——

"OPERATING UNDER THE AMERICAN FLAG"

FAST FREIGHT, REFRIGERATOR and PASSENGER SERVICE

—— PACIFIC COAST PORTS—TO—HAWAIIAN ISLANDS ——

—— SAILING FROM SAN FRANCISCO—Piers 30-32 ——

MAKIKI	(Honolulu-Pt Allen-Abukini) Oct 1	MANUKAI	(Honolulu-Kahului) Oct 16
(Rec. Pt Allen & Abukini 11th to 20th; Honu 11th to 24th, Pier 43)		(Rec. Oct 8 to 13th, Pier 32)	
TACOMA	(Honolulu-Kahului via Los Angeles)... Oct 2	MAUNAWILI	(Honolulu-Hilo)... Oct 13
(Rec. Sep 15 to 25th, Pier 30)		(Rec. Oct 8 to 13th, Pier 30)	
MONTEREY	(Honolulu only)... Oct 6	MALIKO	(Honolulu-Hilo-Kahului-Port Allen-Abukini) Oct 29
(Rec. Sep 28 to Oct 2, Pier 30)		(Rec. —— to 0h, Pier —)	

(Freight only)

—— SAILING FROM LOS ANGELES ——

TACOMA	(Honolulu-Kahului)... Oct 8	MALIKO	(Honolulu-Hilo-Kahului-Pt Allen-Abukini) Oct 27
(Rec. Sep 24 to 29th—Freight only)		(Rec. —— to —h—Freight only)	

—— NORTHWEST—HAWAIIAN ISLANDS SERVICE ——

STEAMER	PORTS OF CALL	Leave Tacoma	Seattle	Portland
MERIDIAN VICTORY	(Honolulu-Kahului-Hilo)	Sep 24	Sep 29	Oct 4
(Receives at Tacoma Sep 17 to 22nd; Seattle Sep 17 to 24th; Portland Sep 21 to 28th.)				

—— ATLANTIC—GULF—HAWAIIAN SERVICE ——

WESTBOUND—(Honolulu-Kahului-Hilo and one Kauai port)

KATHLEEN S HOLMES. ....Mobile Sep 30 .... Norfolk Oct 7.... .....New York Oct 15

EASTBOUND—S.S. (——————) .....(——————)....

THE OCEANIC STEAMSHIP COMPANY

MATSON NAVIGATION COMPANY, Agents for War Shipping Administration

PAGO PAGO—SUVA—AUCKLAND—WELLINGTON

SYDNEY and MELBOURNE

SAILING FROM SAN FRANCISCO

CAPE GEORGIA	(Melbourne, Sydney, Brisbane)—(Receives Sep 7 to 21st, Howard Ter, Oakland)	Sep 28
CAPE FRIENDSHIP	(Auckland, Wellington, Melbourne, Sydney) (Rec. Sep 17 to 28th, Howard Ter, Oakland)	Oct 5
PERMANENTE (R)	(Papeete, Auckland, Noumea, Suva, Pago Pago)—(Rec. Oct 10 to 18th, Howard Ter, Oakland).	Oct 25

(R)—Carries Refrigerator cargo

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Manila, an old picture. All the land shown in the above photograph of the waterfront of Manila, capital city of the Philippine Islands, has been filled in by dredging the bay. Pier shown in the center distance is the famous Pier Seven. At the upper right facing Burnham Green is the Manila Hotel. In the center foreground are the Army and Navy Club, left, and the Elks Club, right. Dewey Boulevard, the two-mile-long esplanade, extending along the waterfront, is also shown. In this war, Pier Seven was bombed by the Japanese, bombed by the Americans, blown up by the Japanese, and is now rebuilt and operating.

we can start anything. Without good government, the people can do nothing, and in China we have no government, and were miserable for centuries. . . . My fellow-students, you and I have studied in this English Colony, and in an English University. We must learn by English examples. We must carry this English example of good government to every part of China."

Canton

Oldest of the China ports opened to foreign trade, Canton is also best loved among Chinese in America, for it was either the home or port of departure for most of them. Far to the south along the Chinese coastline, Canton's foreign trade, in addition to including the major products of China, carries the influence of Indo-Chinese and Malayan commerce for which Canton is the chief Chinese port.

Manila

Traffic to and from the Philippines has been going on for the past two months and is increasing constantly. When decisions are reached in the U. S. Congress on future trade policies with the Philippines, there will



Oscar G. Steen, A.P.L. vice president for Orient, and Paul H. Bordwell, assistant vice president for Orient.

American President Lines Orient staff. Left to right are: James Wells, E. C. Bogle, A. H. Terry, P. H. Bordwell (assistant vice president), Geo. J. McCarthy (possenger manager for Orient), J. W. Clague, Oscar G. Steen (vice president for Orient), L. Q. Haven, Jr., C. W. Gabrielson, L. B. Jepson, Allan Laidlaw, D. C. Downing, J. M. Conway, L. M. Manor, W. J. Baumann, H. M. Rowland, E. M. Airriess, and E. S. Wise.

All of the above except Bordwell and Baumann were prisoners of war and are now in San Francisco awaiting transportation back to their posts. Nine others, under T. B. Wilson, have already left.



Pacific WORLD TRADE



Not alone in the Orient is trade resuming. This is a trolley stop in Sao Paulo, Brazil.



Singapore. The Palm Court, Raffles Hotel. Colonel Raffles founded Singapore.

Hong Kong—possibly greater. The ingredients are there and the results will soon appear.



The famous Capacabana Beach, Rio de Janeiro.

unfold a new era of world history. When General MacArthur formally returned the government of the Philippines to civil authority, he stated that Manila would be the symbol of democracy in the East, and the American people seem to agree. As a commercial center, Manila has a brilliant future in comparison with other cities of the Orient because it alone of the invaded cities was destroyed.

There are many who believe that with a free port at, or near, Manila for the processing and reshipping of the products of the surrounding territory, Manila would become as great a shipping and commercial center as



Sydney. The circular quay, showing the famous bridge and the Matson liner Malolo (now Matsonia) at the dock.

One is apt to meet little fellows like this in some parts of the Orient . . .



Singapore

Malaya and the Straits Settlements and even the Dutch Indies suggest to the Western mind the city of Singapore. Much of the produce of the entire world finds it way to Singapore for shipment. There is hardly a product of commercial importance but that Singapore imports it, and when Americans think of their own imports the products that come first to mind are the products that Singapore ships.

By far the largest item shipped from Singapore is rubber from Malaya. Contrary to general opinion, rubber did not originate in Malaya but developed from seedlings brought from the Kew Gardens in London, an outstanding example of what foreign trade can do. Next to rubber, the most important export from Singapore is tin, while copra, spices, and rattans are also of primary importance.

Singapore, like Hong Kong, was developed on a barren island by British interests and was largely the result of the industry and inspiration of one man, Stamford Raffles. Developed during a comparatively few recent years, it had the pre-war reputation of being the seventh port of the world and the gate of the Far East. It will not be long now until Singapore resumes its place in the world trade picture.

. . . or this.



A Brief Appraisal of Foreign Trade Potentialities

by

Eugene P. Thomas

President, National Foreign Trade Council, New York

America's export trade in the next two or three years will exceed the highest volume recorded during any year prior to the war, and within five years may surpass the $5,250,000,000 level of 1929 by $3,000,000,000 to $4,000,000,000. Some conservative bankers foresee exports by 1950 valued annually at $8,000,000,000 as against $6,000,000,000 in imports.

The initial spurt will result from the pent-up global demand for American goods, ample funds accumulated by Latin American and other countries, and international credits largely supplied by the American taxpayer. The latter may never receive total repayment of the loans made through such agencies as the Export-Import Bank, or the International Bank for Reconstruction and Development, yet to be set up under the Bretton Woods agreement. It is confidently expected that agreements which will undoubtedly be made with Great Britain to provide financial assistance will serve reciprocally to unfreeze the Sterling bloc and mitigate the restrictions on the purchase of American goods by units of the Sterling area.

The taxpayer may look upon the financial aid envisaged through our Government agencies as part of the price of the war and as a good investment, because credits from this country are necessary if Europe and other devastated sections are to avoid economic chaos, revolution and the threat of future wars. Many foreign loans are rarely repaid in any event, but refinanced. The investor is content if he receives adequate interest payments and sound opportunities to reinvest, while the country as a whole will benefit from the investments and the consequent increase in trade and employment.

To have our money returned to us we would have to increase our imports over our exports. But by extending credits now we stand a fair chance to put the world on a path of



Eugene P. Thomas.

sound economic development, giving Europe and other areas greater consuming ability and thereby increasing demand for our products.

The science of production has advanced twenty years during the war. The United States will be able to offer products, machinery and equipment to countries that have been educated by lend-lease to want goods of American quality. One of our greatest export industries, the motion picture, has stimulated in people all around the world a desire for American products, and they will want all they can buy.

Although strictly screened and controlled, America's cash export volume was substantially maintained during the war. We will not be starting from scratch. Many countries, nevertheless, are starved for American products and have built up ample funds for purchases, notably Latin America, ready to take up to $800,000,000 annually. They will be among the immediate customers, along with India, South Africa, the Scandinavian countries and others, including Canada, one of our best customers.

Added to the foregoing, the Export-Import Bank's resources, the capacity of the anticipated International Bank, and whatever funds are extended to Britain, with the pent-up purchasing power of countries which have exported largely in excess of imports, help to bring total available means of financing exports up to $20,000,000,000.

We disbursed some $200,000,000,000 or more to win the war. If it had continued, we might well have expended hundreds of billions more. A relatively few billions can be afforded to avoid economic chaos in Europe, great unemployment here, and disruption of world economy. It will come back to us, if not eventually in cash — then in what may prove even more valuable, in the relaxation of restrictions on our export trade, in increased employment and in increased imports of desirable goods.

Standard Oil Reopening Export Markets

In a quarterly report to stockholders, President H. B. Collier of the Standard Oil Company of California announces that the company has taken prompt steps to participate in the revived export markets of countries in the Pacific area that were formerly enemy-occupied, as well as in other territory where rationing and transportation restrictions have limited consumption.

Oil company activities touch foreign trade in more than one way. In addition to the many products that are capable of being exported, petroleum is a major import commodity and it is expected to grow in importance as domestic supplies diminish. In addition to this, petroleum is of course the fuel for the world's merchant fleets.

Pacific World Trade

Mining Opportunities in the Orient

(CHINA--KOREA--PHILIPPINES)

By Samuel H. Dalbear

The defeat of Japan, rendering impotent its avowed policy of driving Occidentals from the Orient, the liberation of Korea, the determination of China to become an industrial nation, and the need to rebuild the Philippines, opens up new opportunities for American energy, capital, technical skill and trade in Asia, the mining frontier of the world. Not that mining is new to Asia. Certainly it is older there than in America if, as believed by some, the American aborigines and their successors, the American Indians, are, or were, a Mongoloid race. From a miner's point of view, Asia is a huge mineralized area, much of it unexplored. Exploration and development has been retarded in many regions for lack of roads and transportation, distrust and hostility of native populations, and weak governments unable to provide protection. For years industrialization was opposed. The first railroad in China—a short line built as an experiment in the '80's—brought vigorous protest from natives, who contended that the spirits which inhabited the streams and canyons would resent bridges and railway cuts, and would bring dire consequences to the country, plagues, droughts, etc. The line was purchased by the Chinese Government and dismantled.

Later construction was faced with not only overcoming prejudice but was harassed with political intrigue leading to default and bankruptcy. Even in some contemporary works, as those of Lin Yu Tang, industrial development of China is opposed. But poets and philosophers cannot wave away airplanes and bombs, and experience has convinced most Chinese that it is difficult for a nation to survive, protected only by primitive implements.

One contemplating business in eastern Asia may be disturbed by the current reports of difficulties; the threat of civil war in China; the uncertainty of government in the Philippines after it has received its independence; the retention of Japanese in Korea and the Russian occupation of the northern part of that country. It is inevitable that war should bring post-war problems, but on the whole most of these are probably only rocks in the road and will be solved by time, patience and a worldwide determination to find the path of peace. This I say without any attempt to minimize the magnitude of the problems facing Asia.



Samuel H. Dalbear.

Chinese Mineral Resources

China has suffered the ravages of war and invasion. Its industries have been moved from place to place, confiscated by the enemy and, in some cases, destroyed. Its important coal and iron resources in the north were in Japanese hands early in the invasion period and the extensive mineral developments of Manchuria were annexed by Japan almost 15 years ago. The Japanese have developed and equipped these deposits to a point where they not only composed an important part of Japanese war effort, but they may now be utilized in the peacetime industrial economy of that region.

To what extent these industries will contribute to the future of China remains to be seen. They are certain to be important to somebody. Japanese control seems to be definitely at an end, and the Cairo declaration promised the return of Manchuria to China. However, Russia was not a party to the Cairo conference, and whatever governmental control is determined, it is definitely recognized that Russia will insist not only on having a congenial government there, but will also insist on being consulted on any important procedure likely to affect the welfare of that Asiatic region.

The question has already been raised as to why Russia, having no longer to deal with a strong Japanese government, should be concerned with maintaining a sphere of influence in this area.

The safety of isolation and great distances no longer exists. The B-29 perhaps, now an obsolete type of plane in view of rocket development, reduced space to small proportions, but whatever comfort was left in distances seems to have been entirely wiped out, along with Hiroshima, by the atomic bomb. Nations must not only insist upon having neighbors that are friendly, but they will be watching one another intently to see what witches' brew is being concocted in the neighbors' dark cellars. Friendly surveillance? Perhaps.

To what extent these Manchurian plants have been damaged by war or scorched earth activities remains to be seen. The lapse between the Emperor's capitulation and that of the Kwantung army, a powerful semi-autonomous group, left time for dynamite and the fire brand. So far no

(The author is a consulting mining engineer, New York-Los Angeles. The text was presented before a meeting of the Mining Committee of Los Angeles Chamber of Commerce September 12, 1945, and revised by the author to include audience discussion.)

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The Suyoc Consolidated Mine in the Philippines, probably destroyed by the Japanese.

reports of such activities have yet been published. News, however, is slow under the conditions which have prevailed there.

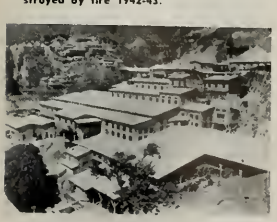
In southern China are the tin and tungsten deposits, in the areas in and around Yunnan Province, also largely in Japanese hands since 1942. It is rumored that much tungsten went underground as the Japanese approached; that is, it was buried to prevent seizure. Very likely a lot of it was sold for Japanese money, willingly or otherwise. If it was buried, it will now come to light and will appear in the United States markets in due course.

To the west of Chungking, in the The Tibetan Mountains, is a large frontier region, known to contain minerals, and litt'e explored. One result of this war has been to open roads leading toward and into this region. If the Chinese adopt laws under which foreign venture capital can operate and offer suitable protection, this might conceivably be the scene of a stampede similar to those of the days of '49, and the Klondike.

Formerly petroleum in China was believed to be non-existent, and some published statements explain why no petroleum can be present. Nevertheless, substantial amounts have been found, and while the reserves may not be as extensive as those found in California, the discoveries in Kansu Province and elsewhere will prove important in the economy of China.

At no time in its long history has China given so much attention to industrial development based on its mineral resources. A large number of American engineers are already in that country, under the auspices of United States governmental agencies. Their efforts should aid in the development and utilization of known mineral resources, the discovery of new deposits, and should extend the demand for foreign equipment and supplies.

Antamok Goldfields Mining Co.'s plant. This company is the third largest producer in the Islands and is one of the operations of the Soriano group. Destroyed by fire 1942-43.



Korean Mineral Resources

Korea is about to be freed of Japanese and presumably is to receive its independence. The pattern of the future in Korea differs in some aspects from that of other Asiatic countries. Japanese control in this country appeared in 1905, when, with the tacit consent of the United States, notwithstanding that it was bound by solemn treaty to guarantee the freedom of Korea, Japan established a "protectorate." "Protectorate" or its modern version of "trusteeship" might easily be translated into ownership, and that is what happened in 1910 when Japan abandoned all pretense of its obligation to "protect" Korea, and proceeded to annex that ancient country as an integral part of Japan.

Even annexation proved to be a pretense, for Koreans have never had full rights and privileges as Japanese citizens. Important government positions were filled by Japanese, the Koreans being given minor posts. No Korean was permitted to control important industries. Minerals produced in Korea were sold to Japan at prices far below figures which might have been realized in a free world market. Gold, for example, was required to be sold to the government Bank of Japan at $26 to $28 an ounce, while the world price was $35.00.

Forty or more mineral products are produced in Korea, with an annual value of 150 to 250 million dollars. It is difficult to appraise the exact value, as statistics of production in the past have been available only from Japanese sources, and when these are given in terms of Japanese money (the yen), they have usually represented figures of sale available to controlled Japanese purchasers, and not those which might have been realized had the mines been owned and operated by Koreans with freedom to sell output in the most favorable markets.

Mineral products of Korea include a long list, starting at aluminum and alunite and going down through the alphabet to cement, fluorspar, graphite (amounting to 30 per cent of the world's output), gold, iron, magnesite and magnesium, petroleum, phosphates, salt, tungsten and zinc. There are hundreds of these operations employing labor variously stated by Japanese sources from 220,000 to 480,000 men, heretofore operated by Japanese, which will now need to seek new management and engineering assistance. It is possible that 10 to 20 thousand foreign executives and

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engineers above the grade of foreman will be needed. The need for such a large number in a short time is one of the problems facing Korea; a need that conceivably could absorb all those suitably trained men likely to be available from the closing of American war operations in the mineral industries.

Most of the important gold and coal mines are located north of Seoul, the capital, in the area north of the 38° Latitude, which has been occupied by Russian forces. The Russian-occupied zone also includes many of the other mineral resources.

It is too early, of course, to appraise the result of this divided occupation, but it seems certain that there is little to be accomplished industrially until, and unless, there is a uniform pattern of occupation, or unless Korea is given not only its freedom from Japanese but its freedom from other foreigners, and therewith its independence. It appears now that some plan of trusteeship may be established with a board of trustees represented by the United States, Russia, China and possibly Great Britain.

Korea has been struggling for 40 years for independence. It now has freedom from the Japanese, and as a substitute, occupation in the north by Russia, and in the south, less important from a mineral raw-material point of view, the United States. The Korean voice will be loud and long in the insistence for independence, and in this it is certain to have the support of American public opinion.

What will be the physical condition of Korean mines after completion of occupation now going on?

Here, as in Manchuria, the Japanese have had time to do much damage, although the suddenness of their capitulation may have prevented such widespread destruction as took place in the Philippines.

If this is the case, there may be widespread opportunities for Americans to take over and operate established mineral enterprises. No policy for granting of concessions has yet been announced, but this conceivably may follow the plan announced by China in which foreign capital is permitted control.

Philippine Mining Industries

In most cases, mine plants have been carried away or destroyed in the Philippines. The Haussermann properties, Benguet and Balatoc mines, are the only American-owned operations, although American, British and other European capital is present to some extent. While surface plants at Balatoc and Benguet mines are reported gone and the underground workings in some cases have been reported damaged by fire or timber failure, the company has adequate cash resources in the United States to restore operations. In this respect its position differs from most other operators, whose cash reserves and working capital were kept in Manila or elsewhere on that side. To what extent Philippine banks will be in a position to honor checks of their depositors is yet unknown on this side, and even branches of American banks have not yet developed a formula so far as I know.

These Philippine mining concerns probably have a legitimate claim for war indemnity. It is unlikely, however, that indemnities will be paid promptly. It may require several years. If this is the case, mine and plant reconstruction will have to be financed for the time being in some other manner. Under some conditions these mines may be entitled to help from American Government agencies, such as Reconstruction Finance Corporation. However, if the time schedule is observed, the Philippines will attain independence in July of next year, and this may affect their eligibility for loans. Sooner or later a large amount of American machinery and supplies will be needed for this reconstruction, and some Philippine mines will probably be in the market at an early date.

Manufacturers and dealers in supplies required in these countries need to be alert to this business. With shortages in materials in this country, a condition likely to prevail for some



Modern placer mining in Korea. The Korean Exploration Company's gold dredge at Chicksan.

months, American manufacturers may feel that it is simpler to supply domestic customers. It would be unfortunate indeed if they neglect the Asiatic markets for this reason. If they do, there may be a permanent loss of these markets which may later be badly needed to provide an outlet for American goods, when, in due course, domestic markets have been satisfied.

Aside from the likelihood that British, German and other manufacturers will sell goods in Asia now, the United States Government has shown an alert interest in assisting in the reconstruction of eastern Asia, and such Government organizations as United States Commercial Company may be utilized to insure adequate supplies to those countries, if private industry fails to function there promptly.

California manufacturers are in the best possible geographical position to supply these markets and it would be unfortunate if they do not efficiently serve eastern Asia now to insure that they shall have an adequate place in this trade later when it may be urgently needed as a supplement to domestic business.

Asia is the trade frontier for California, and it is the mining frontier inviting Americans with skill and capital.

The Oriental Consolidated Mining Company's mine and part of comp at the Tabowie Mine, Pukchin, Korea.



Foreign Trade—Are You In It?

By Dr. Clayton D. Carus

Professor of Foreign Trade, University of Southern California.

Our trade with other lands touches the lives of every one of us in various ways. Dr. Carus suggests a few of them, and in doing so he plants the thought that in every business, large or small, there may be items that are capable of development into export or import volume. This is a good time to analyze the possibilities.—Ed.

We are all in foreign trade because we are all influenced by the imports that we buy, of which I mention:

Palladium from Colombia to make the hairsprings of our watches keep good time. Goatskins from India, Brazil and Venezuela to make the uppers of our shoes. Carnauba wax from Brazil to supply us with shoe polish and candles, and to keep Fibber McGee and Molly on the air. Vanadium from Peru and elsewhere to keep our automobile springs from crystallizing. Dried egg albumen from China and potato flour from Hungary to keep you in doughnuts. Olive oil from Spain, Italy and Algeria to make your mayonnaise. Bauxite from New Caledonia or Dutch Guiana to make our aluminum. Fossilized copal from East Africa to provide the varnish on your furniture and floors. Stic-lac from Madras to make shellac. Balata from Brazil, British Guiana and Peru to impregnate woven power belting and to surround the submarine cables that cross the ocean floors. Gutta-percha from Borneo for the same purposes and others. Palm nut oil from West Africa and Sumatra to make soap. Hog bristles from Russia and China to make our brushes. Camel's hair from Asia and Africa to make our overcoats. Carpet wool from Uruguay to make our rugs. Ramie from China to make our palm-beach suits. Wood pulp from Canada, Sweden, Poland and Finland to supply our newspapers. Surgical instruments from Austria and Switzerland. Musical instruments from the same countries. Tragacanth from Syria and Lebanon to permit us to mix oil and water. Manila hemp from Cebu and Luzon to make our ship's cordage. Gum arabic from Ethiopia to make our mucilage. Tartaric acid from Spain and Portugal to make our baking powder. Glazed firebricks from Scotland to line our furnaces. Centrifugal machines from Denmark and Switzerland to treat beet sugar juice. Copper concentrates from Belgian Congo and Chile to supply America's necessities in refining half the world's copper. Chromium from Kenya and Billiton and Baluchistan to decorate our metal fixtures and automobiles and to toughen our armor plate. Antimony from China to make our pot metal and car body hardware and linotype forms. Rotenone from the middle Amazon to fight bugs and fungi in our gardens. Laces and embroideries from Portugal, Madeira, Paraguay and Malta to decorate our women. A half million birch burl cases and boxes from the Siberian Eastland to hold our cigarettes and gems and gewgaws. Satinwood logs from Siam to veneer our expensive living room sets. Jute fiber from the fetid Ganges valley to make the warp of our finest American rugs. Chicle from Guatemala and British Honduras to keep Mr. Wrigley in business. Balsams from Salvador, Canada and Colombia to supply our hospitals. A quarter billion bushels of wheat from Canada to blend with our flour so we can have light bread. Pitchblend concentrates from Canada to provide our radium. Molave timber from the Philippines to give our mahogany furniture, and the real material from Nicaragua for a similar purpose. Henequen from Yucatan to give our cordage companies a world monopoly in binder twine, which our grasshoppers won't eat. Potato vodka from the Ukraine to ease early evening pangs. Platinum from the Urals and

The Matson liner Malolo (now Matsonia) entering Honolulu harbor.



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from the Atrato valley of Colombia to provide the make-and-break points of B-29 engines. Wattle bark from South Africa and Australia to blend with quebracho from Argentina and Paraguay with which to tan that half of the world's leather processed in the United States. The iron ore from Brazil, Cuba and Chile which has been going to the Pittsburgh iron and steel industry for the last 20 years. Mercury from Mexico. Wolframite from Greenland. Acids by the dozens from Western Europe—all these and 400 more little-known and seldom - mentioned products, which are wholly or partly essential to American industry.

You will observe I have not, nor shall I, trouble you with the many **major** commodities without which our society languishes. They are presently in mind, and include coffee, rubber, tea, sugar, copra, bananas, cocoa and silk.

This will help support the thesis "we're all in foreign trade."

Therefore, anyone who eats, who wears clothes, who earns his living or has it earned for him; the physician, the attorney, the school teacher and the postal employee, the news reporter and the engineer—all these and all others cut across one or more of the 18 types of activity into which the field of foreign trade is divided.

This is not solely because something we eat or wear or use came from a foreign country; it is not because we in the United States buy 1700 different categories of goods, representing 12,000 individual types of commodities, but rather it is because the entire realm of commerce, both foreign and domestic, is a flow of goods and services which have neither a beginning nor an end.

Take Southern California, for instance.

I offer in support of this generalization the following chain of transactions which carries the Southern California population without exception into the realm of international trade.

In days of peace there annually passed through Los Angeles - Long Beach harbor over thirty million dollars worth of the borates and associated substances produced in San Bernardino County. Twenty millions of this total is shipped to England. This twenty millions in turn pays English processors for the shipments of gunny bags used by Argentine grain growers, which in turn pay for the shipments of Argentine corn that supply the requirements of Los Angeles County's millers and poultry feeders, which pay for the 90-octane gasoline which goes to British India for use in commercial aircraft, which pays for the jute fiber which is shipped to Massachusetts, which pays for the shoes built in that state for shipment to Los Angeles shoe buyers.

I end the chain at that point only in deference to the demands of time and of patience. Actually the transactions continue to function without end, and without beginning. For let it be noted this chain of selling and buying did not actually begin with borates laid down at the harbor.

Rather such delivery was preceded by the employment at Trona of labor and managerial force, each unit of which arrived by train or bus or by private car, and thus in turn consumed tires and fuel and steel and food, while each of these elements in their turn moved back another step to the men and materials which supplied the transportation and the fuel and the food. And so on, ad infinitum.

Moreover the same observations are properly made in reference to every other link in the chain of six commodities. The impact of the Argentine corn alone is actually reflected in the consumer goods stories of Los Angeles citizens. The mill which converts the corn into meal for the corn bread requirements of the Southland

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actually runs an extra two weeks in the year on these corn imports, with all that means to employee incomes, to proprietorship profits and, of course, to the Collector of Internal Revenue—and all because borates paid for grain bags which paid for the corn, which paid for the gasoline, which paid for the jute fiber, which paid for the shoes.

Now let it be noted—if one link in the chain of transportation is destroyed or reduced, so are all the preceding and succeeding purchases and sales, or if not of those, then of some other equally valuable transaction, for all must recognize that every sale is somebody's purchase—no sale, no purchase.

I beg you not to believe this is an academic or abstract concept. There was never anything more real or more significance in the realm of economic activity. It is no long-armed coincidence that invariably finds a country's prosperity or prostration carmarked by the rise or fall of foreign trade. There are no economic accidents.

But the impact of foreign trade upon everybody need not be re-

The port of Santos, Brazil.



stricted solely to the manifestations presented above. Those were complex, as are all foreign transactions; those were involved and difficult to comprehend precisely as foreign trade is involved and almost incomprehensible. More easily recognized are the dollars and cents aspects of international transactions.

Have you ever visited Chile, the Southern California of South America? If so, you were engaged in foreign trade, not because you were visiting a foreign country but because you became a consumer of Chilean hotel service, railway service, foodstuffs, scenery and personal associations in the only way it could ever be consumed by you—namely, by consuming on the spot.

Thus you were an importer, and to the extent of your expenditures for such purposes, so did the Chilean nation become an exporter of the same services and to the same values.

But meantime, your Chilean sojourn has been reflected in another category of international transactions. The amount of your expenditures within that country will have created their equivalent dollar deposits in the United States for the use of a Chilean merchant with which dollars he can pay for the motion picture film which he will show in his theater or the soap he will buy or the new tires or the hardware or the textiles, or whatever.

Let me now present the case of foreign trade in still another fashion. The foreign trader is a contributor to total national income, and I mean everybody's income—not government revenues—in a proportion altogether out of keeping with his numbers.

In most years the American worker, including the banker, bartender and bottle-washer, **does well to earn $1100 per year.** But the average person of the 70,000 primarily engaged in foreign trade earns 3½ times that amount. This means all of them. It is an average composed of longshoreman and foreign freight forwarder, customs broker and ship chandler, the girl in the cage of the bank's foreign department and the writer of port news in the daily paper.

All are included, and all are consumers of our national production. This disproportion of income is not the result of sharp practice or double dealing; it rests upon the demonstrable fact that theirs is an operation involving high skill and high productivity.

Finally let me present the advantageous aspect of foreign trading in a still shorter fashion. Every dollar's worth of United States commodities sold abroad represents nearly 1½ dollars of addition to our domestic productivity, while every dollar's worth brought into this country results in 2½ or three dollars worth added to our national income.

It is for this reason that foreign traders insist that 10 billion dollars worth of foreign trade is equal to 20 billions of domestic.

The reasons are shortly stated. The volume of export commodities reduces the expense of producing each item of total output; while each dollar of imported goods becomes three or four or more dollars worth of finished goods.

I submit, therefore, the paraphrased slogan of a motor car maker, "When a better world economy is built, foreign trade will build it," because we are all in foreign trade.

New Delta Line Ships

Heralding the return of fast, luxurious passenger travel from New Orleans to points in Brazil, Uruguay and Argentina, Theodore Brent, president of the Mississippi Shipping Company, announces that construction is under way on three 17,000-ton luxury liners for the Delta Line, and that the ships will be placed in service next spring. Identical in size, speed and accommodations, the ships have been named the Del Norte, Del Sud and Del Mar. They are being constructed by the Ingalls Shipbuilding Co. at Pascagoula, Miss., to the design of George Sharp, naval architect, and will be launched this fall. Cost of the ships will be approximately $3,000,000 each.

Each ship will accommodate 120 passengers, and passenger accommodations will be completely air-conditioned. The design calls for a hull 492 feet in length and 70 feet wide,



Monroe B. Lanier, president Ingalls Shipbuilding Corp., Pascagoula, Miss. Taken on a recent visit to San Francisco.

which with 10,000 shp in geared steam turbine will be capable of speeds up to 16½ knots. Many innovations will be included for passenger comfort and convenience. With their completion, Delta Line sailings from New Orleans will be stepped up to the rate of one ship every eight days.

For the convenience of passengers, each ship will feature a glass-enclosed promenade, outdoor swimming pool and sun-deck, cafe and bar, grand saloon and library, midship passenger elevator, and a modern shopping cen-

Pacific World Trade

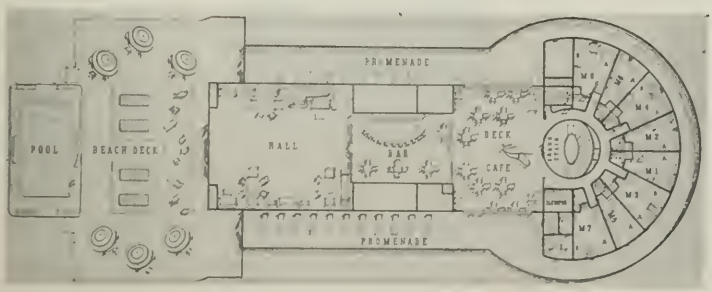
ter. Staterooms and apartments will be equipped with fresh-water showers, extra-length beds with innerspring mattresses, ample wardrobe locker space, and modern furnishings. The ships will make the trip from New Orleans to Rio de Janeiro in 14 days, and to Buenos Aires in 20 days, stopping en route at Santos and Montevideo.

When the ships are placed in service, the Delta Line will feature a 47-day luxury cruise from New Orleans to Buenos Aires and return, allowing one week in the Argentine capital, three days in Rio de Janeiro, and time for extensive sight-seeing trips in Santos and Montevideo.

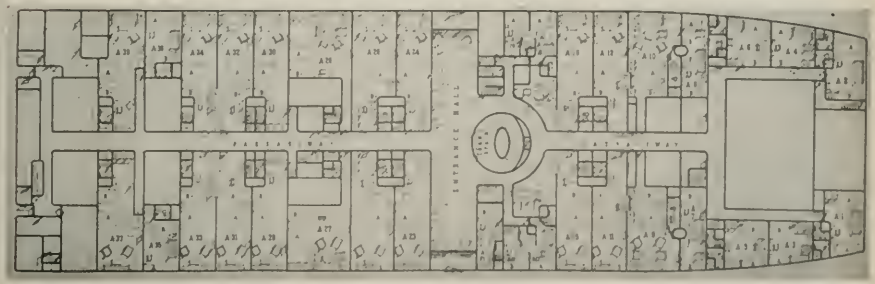
General Steamship Corporation, Ltd., has been appointed General Passenger Agent for the Western States, including California, Oregon, Washington, Arizona, Idaho, Utah, Nevada and British Columbia.



Drawing of new luxury liner under construction at the Ingalls yard for the Delta Line.



Drawing showing accommodation plans for the Delta vessels. Spacious cabins with every convenience indicate the trend in passenger accommodations. The circular cabin on the Promenade Deck is a new departure.



China-America Council Appoints Adviser

Dr. Robert T. Huang, lately assistant general counsel of the United Nations Relief and Rehabilitation Administration, and an authority on Chinese and American business law, has been appointed Resident Legal Counsel to the China-America Council of Commerce and Industry, Inc., Lee H. Bristol, president of the Council has announced. Dr. Huang's office will be in New York.

"With the surrender of the Japanese armies," Mr. Bristol said, "the question of resuming trade relations with China assumes immediate importance. It is now essential that accurate translations of Chinese laws and clear interpretations of the laws and regulations be provided for American firms contemplating doing business with China.

"Having represented American companies in China and served with many Chinese Government agencies, Dr. Huang is particularly qualified to provide advice for the American firms making up the Council in the legal aspects of post-war American trade with and investment in China, which have been materially affected by the abolition of extraterritorial rights. This change for the first time brings American companies under Chinese laws."

Born in Nanking in 1903, Dr. Huang attended St. Johns University in Shanghai and has degrees of B.S. and Bachelor of Laws from the University of Illinois and Doctor of Jurisprudence from Northwestern University.



Dr. Robert T. Huang

Before coming to the United States, the new Legal Counsel of the China-America Council, who will devote his full time to Council work, practiced law in Shanghai for twelve years, representing important American business interests. He served as legal secretary of the Shanghai Bureau of Testing and Inspection of Commercial Commodities, 1929-1931, and of the Ministry of Industries, 1931-1934. He was legal secretary to the Governor of the Central Bank of China and Minister of Finance, 1934-1940, and concurrently, to the President of the Executive Yuan, 1938-1939. In 1939-1940, he was director of the Bureau of Trade Marks.

When the International Labor Organization met in New York and Washington in 1941, Dr. Huang was legal adviser to the Chinese delegation. He served in the same capacity to the Chinese delegation to the Conference of the UNRRA at Atlantic City three years later. From 1941 to 1943 he made a special study of corporation laws in the several states of the United States.

Dr. Huang was an official observer of the UNRRA at the International Labor Conference at Philadelphia in 1944 and a year later at the Conference of the Institute of Pacific Relations at Hot Springs, Va. In 1945 he was appointed a member of the International Secretariat of the United Nations Conference on International Organization at San Francisco, in which capacity he was largely concerned with the drafting of technical legal documents. He was awarded a Certificate of Honorable Mention by the President of the Conference.

The China-America Council is making exhaustive studies of the changed foreign business and trade relationships, due to the renunciation of extraterritorial rights, which will prevail in China after the war. Pending revisions of Chinese commercial legislation, which will affect Chinese trade-mark and patent laws, real property rights, corporate laws and other matters of vital interest to American companies, are also being analyzed and discussed by the Council's Legislative Committee with Chinese and American Government authorities.

China Registration

The American Embassy in China has requested the U. S. Department of Commerce to advise business firms in the United States that the final date for the registration of foreign companies and branches in China has been postponed until December 31, 1945. It is also announced that during the intervening period, a complete revision of Chinese company law and registration regulations will be undertaken.

Pacific World Trade

Awards for Freight Loading Invention



Lieutenant Commander F. L. Ballen, Officer in Charge of the Public Works Division of the Oakland Naval Supply Depot, congratulates Eugene D. Kelly and Jack C. Johnson, co-inventors of a simplified method of improvement in strongbacks and hatch covers on barges, and presents each of them with a check for $125.

In our September issue we discussed the necessity for loading economies. The Army and the Navy are leading the way in these matters. Here is one instance.—Ed.

Two employees of the Oakland Naval Supply Depot have devised a method of improvement in strongbacks and hatch covers on barges which saves equipment, man power and also about 100% in time over the old methods. In announcing this new method, Rear Admiral John J. Gaffney, Supply Officer in Command of the world's largest Naval Supply Depot at Oakland, stated that the Depot Beneficial Suggestion Committee has awarded $125 each to Jack C. Johnson and Eugene D. Kelly of the Public Works Machine Shop for their suggestion.

While working on a repair crew at the Oakland Naval Supply Depot waterfront, Johnson and Kelly noticed the difficulties that arose in removing hatch covers and strongbacks from barges. It was necessary to get a long boom crane and a crew of five men to remove the hatch covers and strongbacks to the top of the barge. When the barge was loaded or unloaded, the crane crew was called back to replace the covers and strongbacks.

Johnson and Kelly saw how much time and work were entailed in this operation and devised a method of attaching the hatch covers and strongbacks so that they could be removed by one or two men, any time or anywhere, without the assistance of a crane.

The strongbacks, which are iron rods under the hatch covers that keep the cover secure, are hung on hinges at one end and secured and released by a trigger arrangement at the other end. They swing back out of the way and are put into place by the same swinging method. The hatch covers are cut in half and hinged at either end; when they are open they fold back and lie flat on the roof of the barge. Formerly the hatch covers weighed close to 600 lbs. Johnson's and Kelly's invention cut the weight of this hatch cover down to 150 lbs. so that it could easily be opened or closed by one man. The hatch cover formerly weighed close to 600 lbs. This invention produced a hatch cover that weighed approximately 150 lbs. The combing was reduced from 8-inch channel iron to 3-inch angle iron. The supports were reduced from 4-inch channel iron to 1½-inch angle iron. The corrugated iron was welded to the supports. All of this helped reduce the weight.

The hinges also secure the strongbacks and hatch covers so that they cannot be lost, and when the hatch covers are closed, they are locked and sealed.

This new operation devised by Johnson and Kelly is a boon to waterfront operations and is being adopted all along the Pacific Coast waterfronts.



Views of hatch covers in open (above) and closed positions.



Industrialization Increases Trade

The industrialization of Brazil does not imply competition with the United States, if for no other reason than that no country can or will be able to compete with the United States for at least ten years.

Extensive industrialization will raise the standard of living of the Brazilian people, creating millions of new customers and markets for products of the highly developed industry of the United States.

Brazil seeks a place among the highly developed industrial countries, like England and Canada, which are among the best customers of the United States. It is worth noting that Canada, with only 12 million inhabitants, in 1944 imported $1,447,226,000 worth of merchandise from the United States. Brazil, on the other hand, with a population of more than 45 million, purchased only about $244,000,000 worth of goods.

The opening up of Brazil's interior by the building of more railroads, highways, and inland waterways will require not only all available native supplies of steel, cement and other construction materials, but also vast quantities imported from abroad.

If, instead of confining herself to the export of raw materials, Brazil ships such products as vegetable oils and fibers and many other products in finished or semi-finished form, she will greatly develop the economic power of her people and make more of them prospective buyers of American goods.

Brazil Authorizes Purchase Of U. S. Railway Equipment

Brazil needs 1000 locomotives and 20,000 freight cars during the next five years and has recently authorized purchase in the United States of 50 locomotives and other railway accessories, according to General Mendonca Lima, Minister of Transportation, it is reported in Rio de Janeiro's newspaper Correio da Noite.

Purchase of the 50 locomotives, as well as structural steel and accessories for construction in Brazil of 2900 one-meter-gage freight cars, is to be made through a special authorized credit of $19,557,000, it is reported. Forty of the locomotives are to be 13 tons per axle and 10 are to be 12 tons, the newspaper states.

"The growing development of Brazilian industries and many difficulties caused by the present war are making deficient the country's railway transportation facilities despite the strenuous efforts of the National Department of Railways," the newspaper quotes General Mendonca Lima as declaring.

With regard to whether purchases already made would solve the railway transportation problem, the general declared that they would insure considerable improvement, but, to solve the problem, Brazil must acquire 1000 locomotives and 20,000 freight cars for the next five years alone.

Change of Agency, American Export Line

In order more evenly to distribute the heavy sub-agency work on the Pacific Coast, it is announced by Charles A. Perkes, Pacific Coast manager of the Parry Navigation Company, Inc., that effective forthwith the Agency of the American Export Line has been turned over to Parry by the Matson Navigation Company, who have heretofore handled the Export Line vessels on this Coast.

Under the new arrangement, the Transmarine Navigation Corporation of Los Angeles will handle any of the vessels in Southern California, while Alexander and Baldwin will continue for the present handling the sub-agency in the Pacific Northwest.

Export Research In Britain

The British Export-Trade Research Organization has been formed under the auspices of a number of large industrial companies of the United Kingdom. These "founder members" are subscribing £500 a year for three years, after which annual dues for all members will be £100. Founder members are to have no special privileges for their extra contribution.

B.E.T.R.O. is to be non-profit making, and may derive revenue from fees for special pieces of research as well as from dues. Its governing council and executive committee are to be unpaid.

The main object of the organization will be export market research, and its information will be obtained by field staffs and marketing investigators who will report on such matters as consumers' tastes, habits and purchasing power, methods of marketing and publicity, transportation, distribution, and insurance facilities, governmental regulations, etc., in the various export areas.

The services of B.E.T.R.O. are intended to supplement those of the British Department of Overeas Trade, which is in full accord with the aims of the new organization, and those of private companies. Members will receive information in answer to inquiries and also by publication.

Prolonged Maiden Voyage of Dutch Hospital Ship

The maiden voyage of the 20,000-ton Netherlands liner Oranje, which started in September, 1939, has now entered its sixth year. Prevented from returning to its home port through the outbreak of war, it concluded its 37th war trip, during which it carried more than 27,500 wounded fighting men from all war fronts.

Captain B. A. Potjer and the 200 crew members have not yet been able to return home. However, most of them soon will be relieved and sent back to Holland.

Pacific WORLD TRADE

Big Public Works Plan For Philippines

Rebuilding roads, bridges, irrigation systems, electrical systems and other public works which were destroyed in the Philippines will cost upwards of $165,000,000, according to the Department of Commerce, and will take at least four years.

Terms on New Ships

The Maritime Commission is reported to have approved the application of the American President Lines for a construction differential subsidy in the acquisition of six C-3-S-A1 vessels for operation in its service from California ports to China, Philippines and Japan.

Under the terms, the APL will receive the 50% construction subsidy which is the statutory limit. Of the remainder of the price, one-half is to be a down payment and the other half spread over 20 annual installments secured by mortgage on the vessels, and with an interest rate of 3½% payable semi-annually.

U. S. Consul General Leaves For Netherlands Indies

Walter A. Foote, who was consul-general to Batavia, Java, and to the entire Netherlands East Indies before the war, and who was one of the very last men to leave for Australia after evacuating all possible Europeans and Americans, has been reappointed to his old post.

During the entire period of the war, Foote maintained such contacts as were possible with the Indies natives and had been working with General MacArthur up to the time of the latter's departure for the Philippines.

After perhaps three months spent in first hand inspection of crops and markets in the Indies, the old time precise reports from the U. S. consul-general will be reaching here regularly.

Matson Office Building

The Matson Navigation Company has awarded a contract to Swinerton and Walberg, San Francisco, for the razing of the Breiling Building and construction of a Class A six-story addition to its present sixteen-story building at Market and Main Streets, San Francisco. The foundations are to carry an eventual sixteen-story building.

Keep Posted!

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

A Remarkable Test

At the plant of the Saverite Engineering Company, Los Angeles, Calif., a group of well-known Southern California steamship operators gathered recently to watch a test of Brickseal. In this test a firebrick was coated with Brickseal and heated in a furnace to 2200° F., then at that temperature it was held hard against a power-driven emery wheel, then quenched in cold water. The coating was still intact and formed a perfect seal.

Left to right in the lower picture are:

Al Boro, J. M. Costello Supply Co.

W. J. Sweeney, Interocean Steamship Co.

Al Norton, Sudden & Christensen Co.

C. A. Jones, Williams Dimond Co.

J. G. Woods, Coastwise (Pac. Far East) Line.

Sherman Elliott, De La Rama Steamship Co.

E. A. Patterson, Burns Steamship Co.

Robert Brown, Saverite Engineering Co.

Bill Rudy, Saverite Engineering Co.

Jack Govan, Saverite Engineering Co.

E. L. Edminston, Saverite Engineering Co.



M. Miller, Oliver J. Olsen Co.

A. B. Sturgeon, Richfield Oil Co.

Carl Rex, Saverite Engineering Co.

E. W. Pearson, American Hawaiian Steamship Co.

J. M. Costello, Costello Supply Co.

Included in the group shown in the upper picture, but not in the lower, are: third from the left, with spectacles, Stan Brummell of W. H. Wickersham Co.; next to left, Ken Huntington of Hammond Shipping Co.; eighth from left, E. L. Wells of Coastwise Lines.

Brickseal has had some very severe tests in battle damage to boilers during the war, and has demonstrated its ability to take extreme punishment in preserving intact the refractory linings of marine furnaces.

New Plastic Strippable Compound

Increased protection of manufactured parts against corrosive elements and against the dangers of rough handling in packing or shipping operations is attained by use of Eronel Thermo-dip, now announced by Eronel Industries, Los Angeles, Calif. Extreme simplicity of application, by dip tank, reduces the unit cost for maximum part protection. Savings in labor and material, "skin-tight" coatings and easy final removal of the protective film (which is reclaimable and may be reused) are additional advantages offered by the new plastic strippable compound.

Of interest to manufacturers, industrial parts users, shippers, warehousemen, automotive and aviation industrialists and all others who use or handle parts subject to deterioration from contact with the elements or contact with other transported goods, Eronel Thermo-dip provides a safe, amber-colored transparent coating that completely resists humidity, impact, abrasion and corrosion.

Applied by the new "hot melt" technique, it possesses many outstanding qualities: (1) it is exceptionally stable, even after prolonged heating; (2) it remains transparent, allowing ready identification of detail on coated pieces; (3) it is easily strippable from odd-shaped parts even after prolonged exposure; (4) it can be applied at temperatures ranging from 280°-325° F., approximately 100° below its flash point; (5) it is reclaimable (may be simply remelted and reused).

When a part is immersed in the melted Thermo-dip, a coating is



Plastic strippable compound.

formed by the chilling of the compound immediately adjacent to the part. Subsequent cooling hardens the coating to a strong film. The coated part may then be handled, shipped, and subjected to extreme climatic conditions without injury. The coating may be removed merely by slitting and peeling. Due to its inherent flexibility and stability, the film remains transparent and easily strippable, even after extended periods.

Eronel Thermo-dip has been found to be particularly valuable in the protection of parts having high surface finish over a portion of their areas, or odd sized or shaped parts where regular preservation or wrapping is difficult. Such parts include bearings, bushings, connecting rods, camshafts, cutting blades, flanges, gears, knuckles, liners, milling cutters, saw blades, precision tools, micrometers, etc., starter spares, spark plugs and many others. It is remarkably efficient as a stop-off coating (in masking parts to be plated) for use in the plating industry.

Handhole Seat Grinder

An automatic handhole seat grinder for use in marine and stationary boiler rooms is announced by the Lagonda Division of Elliott Company, Springfield, Ohio. Handhole gasket leaks, if neglected for relatively short periods, result in grooving of the gasket seats for the handhole plates, the headers, or both.

The new handhole seat grinder provides an easy, faster, more accurate means of refacing handholes of all sizes and shapes through a grinding wheel properly aligned with respect to the gasket seat by means of four screws in an adjusting plate. These assure grinding only in the plane of the gasket seat.

In addition to the grinding wheel, which is mounted on a ball bearing spindle, the assembly consists of a clevis arm, the adjusting plate, and a face plate screwed onto a handhole plate stud near the hole to be refaced. The amount of grinding is accurately controlled by a very finely threaded feed screw. The grinding wheels are double faced for longer service.

The clevis arm provides for free movement of the spindle around the handhole. Any handhole within reach of the grinder can thus be ground from a single position of the face plate, since the spindle arm is movable from one handhole to another. A high-speed compressed air motor such as is used for operating Elliott Company's 2-inch tube cleaners drives the grinder. One half of a slip-on flexible coupling is fixed on the air motor spindle, the other half being fixed on the grinder spindle. A housing provides easy attachment or detachment of the motor, air hose, shut-off valve and motor lubricator.

The grinding wheel is interchangeable with a wire brush provided for cleaning those gasket seat surfaces which require no refacing. For this operation the grinder is used as a detachable, hand-held cleaning tool, and provides a power-driven brush which will serve for a variety of cleaning purposes.

Already proved in service aboard ships, in shipyards, and in stationary plants, the new grinder saves many hours of labor and greatly reduces maintenance outage costs, while doing a better and more accurate job. For example, one man recently spent three days refacing a single handhole in a marine economizer by hand methods. The same man, using this new grinder, refaced 14 badly cut handholes in a similar marine economizer in just five hours.

A cutaway view of the machine in operation.



The complete outfit for this handhole seat grinder includes two grinding wheels, three guide rollers for grinding gasket seats of different widths, a wire brush, stud adapters, plastic mounted viewing mirror, wrench, air hose and a motor lubricator. The entire kit weighs only 25 pounds, packed in a convenient case complete with shoulder strap for carrying.

Rust Inhibitors

Two new types of specialized rust inhibitors have been developed by Carbozite Corporation, Pittsburgh, Pa., manufacturer of industrial coatings. Carbo "C" Inhibitor and Carbo "N" Inhibitor will readily meet the long-felt need for temporary rust prevention on metal materials during inside storage, according to the manufacturer.

Carbo "C" Inhibitor, the more universal of the two, is inactive on all metals and alloys, including magnesium and aluminum. Carbo "N" Inhibitor has no effect on iron, steel or ferrous alloys, although it does have a slight action on softer metals, such as lead, zinc, magnesium and aluminum.

Most steel companies and manufacturers of metal parts have need for a rust inhibitor to prevent oxidization on the surface of such steel or metal parts while placed in inside storage. Carbo "C" and Carbo "N" Inhibitors will successfully prevent rusting of the metal to which it is applied while in such storage. For proper rust prevention on metal materials in outside storage, Carbozite Coatings should be used, as these new types of rust inhibitors are not impervious to rain or snow.

Carbo "C" Inhibitor and Carbo "N" Inhibitor also prevent rust in lines that drain salt solutions from crude oil storage tanks and from the bottoms of tanks where water and brine solutions are used in the manu-

facture of ice, where the brine corrodes and eats into pipe lines and valves very quickly. The inhibitors can be also used as a mixture with cutting oils to protect threads from rust.

Carbo "C" Inhibitor and Carbo "N" Inhibitor are distributed in concentrated form only. This method creates large transportation cost savings, as purchases can be increased by the addition of 25 to 100 gallons of water to each gallon of inhibitor.

Self-Contained Forge

A self-contained forge for faster and easier heating in the blacksmith shop, a new smiths' forge (designed for Navy ship and shipyard use by the Mahr Manufacturing Co., division of Diamond Iron Works, Inc.) should be of interest to blacksmiths and to executives of shops, yards, and plants doing smithing work.

The unit is self-contained, having a fuel (oil) supply tank, pump, motor, blower, burner, combustion chamber, etc., combined within the unit. Plugs into any AC 220 V or 440 V circuit and is ready to light and use.

All of the heat is concentrated at the table work opening, so that bar stock, angles and pieces are heated to forging heat very quickly, and can easily be heated on the end, center, or as the smith desires.

Light fuel oil is used, doing away with smoke and soot.

A Practical Lathe File

Kennametal, Inc., Latrobe, Pa., announces the development of a new lathe file that retains the advantages of previous models in that it will cut steels no ordinary file will touch, at speeds 3 to 10 times faster than possible with steel files, with a life of 50 to 200 times as long, and in addition provides longer filing surface, quick, easy blade replacement, and greater handling convenience.

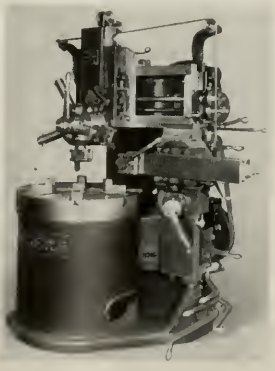
In this new design, the Kennametal blanks have brazed-on nuts, and are attached to the lightweight aluminum alloy handle by screws. They can therefore be readily replaced when worn from long service. Two types of blanks—fine (30 teeth per inch) and coarse (20 teeth per inch)—are available, and are interchangeable on the same handle. The handle grip is shaped to fit the hand, and has a thumb rest and knuckle guard. An extension beyond the filing surface supplies a convenient finger hold. A hole in this extension permits the file to be hung up.

One size is now available—the F-45, 13½" long over-all—with a filing surface ¾" wide x 8" long, comprising two ¾" x 4" Kennametal blanks.

The New "Perfect 36" Mill

Announcement of over a hundred engineering additions and refinements in the "Perfect 36" vertical turret mills has been made by the Rogers Machine Works, Inc., of Buffalo, N. Y. This mill climaxes 60 years of knowing how to build metal-working equipment.

The mill is equipped with an adjustable 5-position main vertical turret that provides tool settings for boring, drilling, reaming, turning and thread cutting. Quick-acting lever permits rapid indexing of turret head. The main stake has an adjustable swing up to 30 degrees each side of vertical in addition to being adjustable left to right and up and down.



"Perfect 36" mill.

Specially designed swivel side head permits setting at any angle up to 35 degrees each side of horizontal. This side head is also adjustable up and down and left and right as well as being designed for indexing to eight positions.

Such flexibility of main head and side head adjustments provides unlimited set-up possibilities.

On production runs set-ups are easily and accurately duplicated by setting dials which are conveniently located at eye level for the operator. In addition the horizontal chuck is scribed to locate duplicating work accurately. Output of finished work is further increased by the motor driven rapid traverse.

Convenient foot controls are instantly accessible to the operator for rapid clutch and brake control and changeover of main drive speeds.

Main gear box is totally enclosed and generated gears run in oil, providing both smooth operation and long gear life.

Complete tooling is available with this mill, as well as 4-jaw independent and 3-jaw universal chucks or plain tables.

B & W Powers the Navy

All but two of the 105 American fighting ships in the Allied Pacific Third Fleet which smashed the Japs in the final months of the war were powered with Babcock and Wilcox boilers.

The 103 vessels which were equipped with the boilers included six battleships, 16 aircraft carriers, 19 cruisers and 62 destroyers. The list of these ships included such world-famous names as Missouri, Iowa, South Dakota (Battleship X), Lexington, Shangri-La, and Wasp.

Among the American ships of the line which entered Tokyo Bay for the signing of the surrender, 130 out of 140 were equipped with Babcock and Wilcox boilers.

The Third Fleet was composed of 105 American and 28 British ships of the line, plus scores of auxiliary ships. During the last two and one-half months of the war, this armada destroyed or damaged 2965 enemy planes and sank or damaged 1600 Jap warships and merchant vessels.



Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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Reemployment Rights for Members of the Merchant Marine and the United States Maritime Service

Personnel of the Merchant Marine, both licensed and unlicensed, and members of the United States Maritime Service, who have entered active service since May 1, 1940; whose service has been "substantially continuous", and who remain in active service until the termination of the unlimited national emergency, are entitled to the identical reemployment rights as are members of the armed forces. That is, those members of the Merchant Marine and of the United States Maritime Service, who left private employment to aid in manning the merchant ships, or to train men to man these ships, and who serve until the termination of the unlimited national emergency, or who may be released before such termination by reason of physical disability, or because their services are no longer necessary or desirable, are entitled to their old positions, under provisions of Public Law 87, approved June 23, 1943.

In order to be eligible for restoration to the positions which they left to enter the Merchant Marine or the United States Maritime Service, they must first obtain from the Administrator, War Shipping Administration, a Certificate of "substantially continuous service", and to be eligible for such Certificate their service must fall within certain requirements set up by the Administrator, which requirements are set forth fully in this article.

Members of Merchant Marine
(Eligibility for Reemployment)

In order to be eligible for the benefits of Public Law 87 as to reemployment, a member of the Merchant Marine must meet the following conditions:

1. He must have left a position, other than a **Temporary** position, since May 1, 1940, and prior to the termination of the unlimited national emergency, to enter the Merchant Marine. **(Note: VJ Day proclaimed by the President on September 2, 1945, WAS NOT the termination of the Unlimited National Emergency.)**

2. He must have served as an officer or member of the crew on, or in connection with, a ship documented under the laws of the United States, or owned by, chartered to, or operated by or for the account of the War Shipping Administration.

3. He must obtain a certificate of "substantially continuous service" from the Administrator, War Shipping Administration, and in order to be eligible for such certificate he must have served in the Merchant Marine at least 75 per cent of the time between the first date he entered the service and the termination of the unlimited national emergency, unless sooner discharged or released—

(a) Because his services are no longer necessary or desirable;
(b) Because of his being permanently disabled for further service in the Merchant Marine as the result of illness or injury not caused by his own wilful misconduct.

4. He must apply for such certificate within the times specified by the Administrator, War Shipping Administration.

5. He must still be qualified to perform the duties of the position which he left to enter the Merchant Marine.

6. He must apply for such position not more than forty (40) days after the date of his certificate.

Members of the United States Maritime Service
(Eligibility for Reemployment)

In order to be eligible for the benefits of Public Law 87 as to reemployment, a member of the United States Maritime Service must meet the following conditions:

1. He must have left a position, other than a **Temporary** position, since May 1, 1940, and prior to the termination of the unlimited national emergency, to enter the United States Maritime Service.

2. He must have served as an enrollee in the United States Maritime Service; or

3. He must have served as an enrollee or student in any school of instruction, including the United States Merchant Marine Cadet Corps, and any State Maritime Academy, under the jurisdiction or supervision of the Administrator, War Shipping Administration; or

4. He must have served in any combination of the foregoing; or

5. He must have served in any combination of service in the United States Maritime Service and the Merchant Marine.

6. He must obtain a certificate of substantially continuous service from the Administrator, War Shipping Administration, and in order to be eligible for such certificate he must have served in the United States Maritime Service (or in any of the combinations set forth above) at least 75 per cent of the time between the first date he entered the

service and the termination of the unlimited national emergency, unless sooner discharged or released—

(a) Because his services are no longer necessary or desirable;

(b) If he is permanently disabled for further service in the United States Maritime Service as the result of illness or injury not caused by his own wilful misconduct;

(c) If his retention in the United States Maritime Service would result in extreme personal hardship to himself and his family.

7. He must apply for such certificate within the times specified by the Administrator, War Shipping Administration.

8. He must still be qualified to perform the duties of the position which he left to enter the United States Maritime Service.

9. He must apply for such position not more than forty (40) days after the date of his certificate.

Not all enrollees of the United States Maritime Service are entitled to a certificate of "substantially continuous service". Those held not to be entitled to such certificate are—

(a) Men disenrolled from the service for being AWOL or AOL.

(b) Men disenrolled at their own request when their services are still needed, in the absence of a showing to the satisfaction of the Administrator that their retention in the service will cause them and their families undue hardship.

(c) Men who fail to ship out who have been released for shipboard assignment.

Headquarters of the Training Organization, War Shipping Administration, Washington, D.C., in their **Training Organization Instructions No. 46 (Revised),** issued 24 August, 1945, state as follows:

"All applicants for Certificates of Service who hold or who because of training are eligible to receive seamen's papers must be referred to the Recruitment and Manning Organization. This procedure is necessary because, although the responsible officer may determine that the applicant meets eligibility requirements for a certificate's issuance, his services may nevertheless be utilized in the Merchant Marine. For example, despite the fact that it is ascertained that the United States Maritime Service no longer needs or desires the applicant's services, his service in the Merchant Marine may still be very necessary or desirable".

The Act is to be administered by local Selective Service Boards—Draft Boards—in the various localities, who have volunteered to aid discharged members of the Merchant Marine and the United States Maritime Service in the same manner in which they aid discharged members of the armed forces. Local Board Memorandum No. 190-B, issued October 31, 1944, provides as follows:

Extension of Veterans' Assistance Program to Former Members of the United States Merchant Marine:

1. **Reemployment rights—former members of the United States Merchant Marine.** Public Law 87, 78th Congress, approved June 23, 1943, extends to persons who, after May 1, 1940, left positions "in order to perform service in the Merchant Marine" of the United States, reemployment rights substantially similar to those set forth in Section 8 of the Selective Training and Service Act of 1940, as amended, except that no person is designated to render aid to such former members of the Merchant Marine in securing reemployment or new employment.

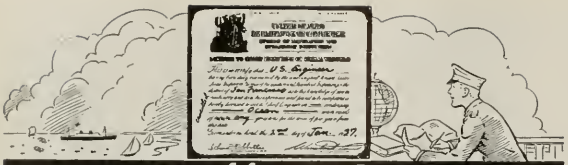
2. **Selective Service System to render aid in reemployment.** At the request of the Administrator, War Shipping Administration, the Director of Selective Service on October 4, 1944, undertook the responsibility of rendering aid to the former members of the Merchant Marine who are entitled to the benefits of Public Law 87 in securing reinstatement in their former positions. **However, the Director of Selective Service has not assumed any obligation to render aid to such persons in securing new employment.**

3. **Certificates of service required.** Public Law 87 provides for the issuance of a certificate of "substantially continuous service in the merchant marine", the reemployment rights of former members of the Merchant Marine being contingent upon the possession of such certificate. The regulations providing for the issuance of certificates of substantially continuous service have been promulgated by the Administrator, War Shipping Administration. Any person seeking the benefits of Public Law 87 who does not possess such a certificate should be advised to apply for such certificate without delay in order that he may comply with all requirements of Public Law 87 within the forty-day period specified.

4. **Application for certificates of service.** Application for certificates of substantially continuous service by persons most recently engaged as enrollees in the United States Maritime Service, as Cadet Midshipmen, or as enrollees or students in any school or institution, including the United States Merchant Marine Cadet Corps and any State Maritime Academy, under the jurisdiction or supervision of the War Shipping Administrator, will be processed through the Training Organization of the War Shipping Administration. Application for such certificates by all other persons will be processed through the Recruitment and Manning Organization of the War Shipping Administration. Application forms in either case are identical and are being sent to all regional and port offices of the Recruitment and Manning Organization in the United States, to all schools or institutions under the jurisdiction or supervision of the Administrator, War Shipping Administration, and to all other related facilities of the War Shipping Administration and the Maritime Commission. Application forms may be filed at any office of the War Shipping Administration or Maritime Commission concerned with the recruitment or training of merchant marine personnel, or may be forwarded directly to the Administrator, War Shipping Administration. If any difficulty is experienced by applicants in securing the required certificates, inquiry and application should be made directly to the Administrator, War Shipping Administration, Washington 25, D. C.

The Act is far from perfect. On its face it provides that those members of the Merchant Marine and the United States Maritime Service, whose service has been such as to entitle them to a Certificate of "substantially continuous service", shall be restored to the positions which they left in order to enter the service, unless such positions were "tem-

(Page 620, please)



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco 11, California

Grinding and Turning of Commutators

Sandpapering is a method of resurfacing a commutator which is dirty, or on which the mica is too high. Hand stoning will remove high mica and even small flat spots. These methods were discussed in the August issue. The only really satisfactory method of resurfacing commutators which are badly out of round is grinding, or turning with a tool having a rigid support. All cases of large flat spots, or eccentricity, must be corrected by this method, for no hand-held tool can entirely eliminate these conditions.

Before starting to grind or turn a commutator it should be examined to make sure it is tight. This, of course, should be done while hot, just after shutting down. All repairs should be made before grinding, such as insulation faults, resoldering connections, tightening bolts and so on.

The commutator may be trued in the machine bearings, or the rotor removed to a lathe.

When turning a commutator by running in the machine bearings, the armature must be turned at a proper speed by throttle control of the turbine or engine. Also it may be turned electrically if a motor, or a generator disconnected from its drive, by using a high resistance in series with the armature to slow it down. When turning the armature electrically the tool post must be electrically insulated; however, if the grinding operation is used the stone wheel offers enough insulation. It is, of course, necessary to protect from copper chips. The tool or grinder must have a solid, rigid, non-vibrating support.

If turning the commutator in a lathe, the shaft may be supported between lathe centers or on sleeve bearings. The centers of the shaft should be scraped to cause the surface of the journal to run true. If a long shaft is involved it should have a steady rest support near the commutator to avoid sag and vibration while turning.

The choice between turning "in place" or off the ship in a lathe depends on the size of the armature, difficulty of removal, or of running in place. Small armatures are almost invariably removed to the ship's lathe or the shoreside shop. Armatures weighing over 700 lbs or over 100 hp or kw may better be turned in place.

If a grinding job is to be done, it may be easier to run in place, and it is also better as the armature may be run up to nearly full speed and a running true surface will result. It cannot be turned with a lathe tool at operating speed because the normal surface speed is far above a reasonable cutting speed.

Before either turning or grinding a commutator, the winding of the armature at the commutator end and the risers should be covered with strong paper, using adhesive paper or cellulose tape to hold the wrapping paper against windage. Cloth or canvas can be used tied with strong cord. If grinding at speed it may not be practical to wrap because of difficulty of securing the wrapper. In that case a vacuum cleaner suction may be fastened in a position to collect most of the copper particles. If turning, then large sharp copper chips are sure to lodge in the winding if not wrapped.

In grinding there are two general methods, one with a stationary stone and the other with a revolving wheel of stone or abrasive material. The revolving wheel may be driven by a direct-connected motor, or by a small long belt to a remote mounted motor.

When grinding with a stationary stone, a smooth fine-grained stone should be used. This must be rigidly clamped in a holder which is provided with some means of feed in an axial direction. The radial feed is better by a screw arrangement but may be satisfactory by clamp adjustment.

Some experimenting may be necessary to determine the best cutting speed. High speed commutators may run as high as 5000 feet per minute. Speed equals diameter in feet x 3.14 x rpm. Too much speed may cause the stone to skid or not cut smoothly. Between 1000 and 2000 feet per minute may be found satisfactory.

Fixtures of various types are on the market for holding a grinding stone. Some of these are equally useful for either a turning tool or a stone.

Brushes and brush holders and studs are preferably removed. If running under electric power, two brush holder studs (or more) of opposite polarity should be left in place to energize the armature. These would be on the opposite side, or away from the point where grinding is to be done.

Since the stone wears away in the course of its grinding action, heavy cuts should be avoided, and care taken not to give the surface a barrel or saddle shape, or a taper. Several very light finish cuts will help establish a true cylindrical surface.

The rotating abrasive wheel is considered by most operators as the best method of grinding. A medium soft faced wheel should be used, as the stone will not fill up or impact with copper so readily. Use a light cut to prevent wheel wear from giving a taper to the surface. Also a heavy cut is likely to reproduce any eccentricity in the commutator due to unavoidable spring in the wheel mount and support. When the commutator is badly out of round, or hill and dale

effect, it may be necessary to take many fine cuts at first until the cut is uniform.

Care should be used to drive the wheel fast enough, but not above the speed recommended by the manufacturer of the wheel. Also, if the commutator is badly out of round it may be desirable to run it at a fairly slow speed until the cut is uniform. This will also avoid excessive wear on the grinding wheel.

After the cut is uniform, the commutator may be speeded up to near its normal speed, if not too high for grinding, so that any distortion which takes place at such speed will be eliminated or compensated for by the cut.

The final surfacing may be done with a very fine abrasive wheel or fine grain sandpaper. Some manufacturers put the final surface on commutators with a hand stone. Whatever method is used, care should be taken to eliminate all scratches, especially those in a diagonal direction. A truly polished surface is wanted. Examination with a magnifying glass of about four or six power, and a strong light, should show polish.

If a lathe tool is used for a turning job, use one known as diamond point or a fairly sharp point. The point should be rounded slightly so that the cuts will overlap and not leave a rough thread on the commutator surface. Use only the lightest cut, particularly if it is necessary to remove flats or eccentricity. This is done to avoid the natural spring in the tool support. Also, with a heavy cut the tool may twist the segments, cutting deeper at one edge than the other, and making considerable copper carry over. This difference may be very small, but less than .001 inch is enough to break contact between copper and carbon brush, causing the current to jump this minute gap, giving a marked appearance and bar edge burning.

In general the cutting speed should be in the order of 500 to 600 feet per minute. A rigid support for the tool is even more important for turning than for grinding.

Final surfacing after turning requires more attention than after grinding. One method is to go over it with a stone mounted in the lathe tool support, running the armature at a higher speed. This would then be followed by a hand stone or very fine sandpaper.

After a commutator has been refinished by any of these methods it should be thoroughly cleaned, the armature blown out to remove sand, copper chips, or dust. The surface must be carefully inspected for any copper bridged over between bars or chips jammed in the slots of the undercutting.

The commutator should then be given an electrical test for shorts between bars and/or grounding.

Usually the undercut mica type of commutator will be found aboard ship. If this is the case, the next step is checking the undercutting for mica fins and foreign matter. This will be discussed in our next article.

Swedish Yards Building 105 Vessels for Norway

The first of 26 vessels built at Swedish shipyards during the war for Norwegian account has been handed over to her owners. On July 17 the Gotaverken shipyard of Gothenburg delivered the motor cargo vessel Vingnes of 9370 tons d.w. to the Norwegian shipping concern of Ditlev-Simonsen. The vessel, which is of the modern shelter deck type, has the following main dimensions: over-all length 418′ 0″, molded breadth 56′ 6″ and molded depth to shelter deck 38′ 0″. She is propelled by an eight-cylinder, four-stroke single-acting diesel engine, developing 5100 ihp at 110 rpm, estimated to give the ship a loaded speed of 13¾ knots.

A few days later the motor tanker Montana of 15,300 tons d.w. completed her trials. She was built by the same shipyard to the order of the Norwegian shipping company A/S Tanktransport, Tonsberg, Norway. The Montana has an over-all length of 515′ 2″, the molded breadth is 64′ 0″ and the molded depth to shelter deck 38′ 2″. The propelling machinery consists of a five-cylinder, two-stroke double-acting diesel engine, developing 7000 ihp at 110 rpm. The speed will be 14 knots with full cargo.

Top: M. S. Vingnes, 9370 dw, one of 26 merchantment built in Swedish yards during the war for Norwegian owners and now being delivered.
Bottom: M. T. Mantana, 15,300 dw, another of the ships built for Norwegian owners.



On the Ways—

SHIPS IN THE MAKING



NAVY TRANSPORT DISARMED

Deck gun, one of 23 anti-submarine and anti-aircraft weapons on Navy transport Hermitage, formerly the Italian luxury-liner Conte Biancomano, is lowered over the side of Todd Shipyards Brooklyn Division, as Navy puts transport on peacetime basis, enabling release or transfer of gun personnel.

New U.S.M.C. Division Of Vessel Disposal

Creation of a Division of Vessel Disposal and Government Aids to take charge of disposal of all Government-owned ships of 2000 gross tons and over, pending enactment of a Ship Sales Bill by Congress was announced by the U. S. Maritime Commission. In it are merged the activities of the Commission's Examining Division and the ship sales activities of the Division of Large Vessel Disposal.

Until now the Examining Division has been in charge of the sale of vessels to the subsidized operators while the Division of Large Vessel Disposal has handled the sale of all other ships. Their merger is designed to unify all negotiations on ship purchases. A Division of Redelivery of Chartered Vessels will take over the work of the former Division of Large Vessel Disposal in returning requisitioned ships to their owners.

John J. Miller, director of the former Examining Division, has been designated director of the new Division of Vessel Disposal and Government Aids, with Lt. Comdr. William A. Weber as assistant director.

Commodore Edmond J. Moran, USNR, who joined the War Shipping Administration in April 1942, as director of its Division of Small Vessel Procurement and Operation, undertook the task of organizing and planning the initial stages of the Maritime Commission's large vessel disposal program in addition to his other duties. With the groundwork laid and with the pending enactment of a Ship Sales Bill by Congress, Commodore Moran recommended the creation of the new Division to handle the increased duties involved in the disposal of Government-owned merchant ships.

Marinship Paints Dove of Peace on Tanker's Bow

With a picture of the dove of peace painted high on her bow, the tanker Fruitvale Hills became the first ship launched since end of hostilities, at the shipyard of Marinship Corporation at Sausalito, California, August 25.

High ranking military officers were present when the ship was christened in a burst of champagne by Mrs. John J. Manning. She is the wife of Rear Admiral John J. Manning, CEC, USN, director, Eastern Pacific Division, Bureau of Yards and Docks, United States Navy.

Matron of Honor was the wife of Captain L. N. Moeller, CEC, USN,



Honored guests who are worldwide figures in the petroleum industry were present of the shipyard of Marinship Corporation on September 8. Left to right: J. B. A. Kessler, managing director of Royal Dutch Shell group; Mrs. Sidney Belither, sponsor of the tanker Marin Hills; Miss Ann Belither, maid of honor; and Mr. Belither, executive vice president of Shell Oil Company, Inc.





Left: PEACETIME PORTHOLE. A farewell view of U. S. Steel's Federal shipyard at Kearny, N. J., from a porthole on the bridge of the Tillie Lykes. She is a 12,600 ton cargo carrier for the Lykes Brothers Steamship Company and will be assigned to trade with the Orient.

Right: RESCUED PRISONERS BOARD HOSPITAL SHIP. In Tokyo bay, the Navy Hospital ship Benevolence, converted from a Maritime Commission C-4 hull, was reported to have taken aboard 500 Allied prisoners of war, including the long-missing American ace, Major Gregory Boyington of the Marine Corps. Mercy ship is commanded by Captain C. C. Lows of San Francisco.

superintending Civil Engineer, Area Six, Bureau of Yards and Docks. Master of Ceremonies was Stephen D. Bechtel, vice president of Marinship Corporation and president of W. A. Bechtel Company.

President Hammers in Place Calship's Final Rivet

Calship's 7,065,374th rivet — final rivet in the shipyard's wartime-contracted 467 ships — was hammered into place recently by John A. McCone, president of the California Shipbuilding Corporation.

McCone learned about riveting back in World War I, when he served as a shipyard riveter.

His "bucker-up" for the driving of the last rivet was J. S. Sides, production manager of Calship, who is a former mine worker.

The California Shipbuilding Corporation started work in 1941 and became America's second largest emergency shipyard. With the completion of its final wartime-contracted vessel, the S.S. Council Bluffs Victory, in late October, 1945, Calship will round out 4,814,260 deadweight tons of shipping from its 14 ways.

Calship's 467 ships have required 1,604,788.1 tons of fabricated steel, 131,279,025 lineal feet of welding, 17,102,000 feet of electric cable and 7,065,374 rivets.

End to end, the 467 ships would make an unbroken line 39.4 miles long.

Bethlehem-Fairfield Finishes Program

The Bethlehem-Fairfield Shipyard, which claims the record of building more ships during the war than any other yard in the world under an emergency program, brought operations to an end on September 19 when its 94th and last Victory ship slid down the ways. Three launchings rang down the curtain that day on a 4½ year building program that has produced in addition to the above Victorys, 384 Libertys and 30 LSTs, a total of 508 ships, or some 5,000,000 d.w.t. of shipping.



FOR PEACETIME

Shown standing before the bow of Calship's 463rd vessel are John A. McCone, president of Calship; Mrs. Frazer A. Bailey of San Francisco, sponsor of the SS Mesa Victory; and her husband, Frazer A. Bailey, president and a director of Matsan Navigation Co.

West Coast Yards Still Lead

Merchant shipbuilding construction for the month of August fell to a 36 month low with delivery of 84 vessels agggregating 825,817 d.w. tons from 30 shipyards, the U. S. Maritime Commission announced. The construction program, which hit a peak on deliveries in December, 1943, is now on a downward trend following total Victory of the Allies.

West Coast shipyards delivered 31 of the vessels with d.w.t. of 336,220; East Coast yards completed 26 ships of 286,106 d.w.t.; yards in the Gulf Coast area delivered 21 vessels of 173,431 d.w.t.; while Great Lakes shipbuilders delivered 6 coastal cargo vessels of 30,060 d.w.t.

List of the ships delivered during the month of August follows:



AWAY WITH GRAY!

Dingy wartime gray gives way to bright bands of yellow and blue on funnel of Chanute Victory at Todd's Brooklyn division—symbol of reconversion of American merchant shipping to peacetime operations.

Shipyard	Number	Type
Alabama Dry Dock & Shipbuilding Co.	2	T2 Tankers
Avandale Marine Ways, Inc.	1	N3 Coastal Cargo
Bethlehem-Fairfield Shipyard, Inc.	7	Victory Cargo
Bethlehem-Sparraws Point Shipyard, Inc.	1	T3 Naval Tanker
California Shipbuilding Carp.	6	Victory Cargo
Delta Shipbuilding Co., Inc.	3	Liberty Calliers
Federol Shipbuilding & Dry Dock Co.	1	C3 Cargo
Froemming Brothers, Inc.	1	C1-M-AV1 Caastal Cargo
Globe Shipbuilding Co., Superior, Wis.	1	C1-M-AV1 Coastal Cargo
Gulf Shipbuilding Corp., Chickasaw, Ala.	1	C2 Cargo
Ingalls Shipbuilding Carp.	2	C3 Cargo
J. A. Janes Construction Co., Inc., Brunswick, Ga.	2	C1-M-AV1 Caastal Carga
J. A. Janes Construction Co., Inc., Panama City, Fla.	3	Liberty Cargo (Baxed-Plane Carrier)
Kaiser Cargo, Inc., Richmond, Calif.	2	C1-M-AV1 Coastal Cargo
Kaiser Co., Inc., Swan Island Yard, Portland, Ore.	3	T2 Tankers
Kaiser Co., Inc., Vancouver, Wash.	2	Military Type
Marinship Carp.	1	T2 Naval Tanker
McCloskey & Co., Tampa, Fla.	2	N3 Caastal Carga
New England Shipbuilding Corp.	3	Liberty Carga (Boxed-Plane Carrier)
North Carolina Shipbuilding Ca.	4	C2 Carga
Oregan Shipbuilding Corp., Portland, Ore.	3	Victary Carga
	1	Military Type
Pennsylvania Shipyards, Inc., Beaumant, Texas	3	C1-M-AV1 Caastal Carga
Permanente Metals Carp., Shipyard No. 1, Richmand, Calif.	4	Victory Cargo
Permanente Metals Carp., Shipyard No. 2, Richmond, Calif.	8	Victory Cargo
Southeastern Shipbuilding Corp.	2	C1-M-AV1 Coastal Carga
St. Johns River Shipbuilding Corp.	2	T1 Naval Tankers (Coastal)
San Shipbuilding & Dry Dock Co.	4	T2 Tankers
	1	C4 Cargo
Tadd-Haustan Shipbuilding Carp.	2	T1 Coastal Tankers
Walter Butler Shipbuilders, Inc., Duluth, Minn.	1	C1-M-AV1 Caastal Carga
Walter Butler Shipbuilders, Inc.	3	C1-M-AV1 Coastal Cargo
Walsh-Kaiser Co., Inc.	1	Military Type
Western Pipe & Steel Co.	1	C3 Cargo

American Boats For Indies Rivers

The Odenbach Shipbuilding Corporation, Rochester, New York, has received an order from the Netherlands East Indies Government for the building of 180 towboats and barges, which will transport food, medicines, building materials, and processing equipment into the rubber growing districts of the Indonesian Archipelago, and in return bring crude rubber to the large shipping centers.

The towboats will be diesel engined, fifty feet long, and will have some cargo carrying capacity. The barges will have a displacement of about forty-five tons. All vessels will be shallow draft, entirely welded, and specially designed for navigating the inland waters of Borneo and Sumatra.

S.S. Service Resumed

Resumption of service by the Westfal-Larsen Company Line between the East Coast of South America and the Pacific Coast of the United States and Canada is announced through the offices of the General Steamship Corporation, Ltd., Pacific Coast agents.

The first vessel to re-enter the line is the MS Heranger which will begin loading in the River Plate about November 15, and which will be on the Brazilian coffee berth by the end of November. The line had operated continuously in the trade for more than 16 years until 1942 when its ships were diverted to assist the Allies in the "Battle of the Atlantic".

Announcement was also made that Georg Von Erpecom and Rolf Westfal-Larsen, directors of Westfal-Larsen & Company, Bergen, Norway, are now en route for a visit to the Pacific Coast to discuss the future development of the line, with officials of the General Steamship Corporation and Capt. E. Petersen, owner's representative.

Consolidated Acquires W. P. & S.

Announcement was made September 25 by Alden G. Roach, president of Consolidated Steel Corporation, that the directors of Western Pipe & Steel Company had accepted an offer of $6,217,373 from Consolidated Steel Corporation to purchase all of the assets of Western Pipe & Steel Company. The acceptance of the offer, however, is subject to ratification by the majority of the stockholders of Western.







LAUNCHING THE TUNA CLIPPER STARKIST

Above: Mr. and Mrs. Cecil W. Drake; she, matron of honor of the ceremonies, and he, general manager of United Concrete Pipe Corporation of Long Beach, California.

At right: The Starkist just before she slid down the ways. Mrs. Frank Perry cracking the champagne on the bow of the tuna clipper on August 25 at United Concrete's yard.

New Marine Head Std. Oil of New Jersey

M. G. Gamble, widely known marine and shipping authority, has been appointed general manager of the marine department of Standard Oil Company (New Jersey), it was announced September 13 by Eugene Holman, president. He succeeds B. B. Howard, recently elected to the board of directors of the company.

As assistant general manager during the war, Mr. Gamble was active in coordinating the operations of the Esso tanker fleet while under requisition to the War Shipping Administration to transport oil products to the war fronts.

John J. Winterbottom, manager of the marine traffic division, presently on leave with the War Shipping Administration, has been named an assistant general manager. E. H. LeTourneau continues as an assistant general manager.

Surplus Property Disposal

New and used surplus marine property disposals, including transfers to other agencies, amounting to $11,599,746 with reported returns of $9,385,275 for a recovery of 81 per cent of reported cost was announced August 26 by the U. S. Maritime Commission in a 12 month report covering the agency's disposal activities to June 30, 1945, as follows:

Classification	Total Declarations	Disposals at Reported Cost	Total Returns	Recovery Percentage
Anchors	$ 148,257	$ 22,534	$ 22,534	100%
Barges	3,537,266	2,589,773	1,918,140	74%
Bells, Lighting Fixtures, Marine Hardware	1,182,944	500,347	214,421	43%
Boilers	38,187	19,940	15,000	75%
Buoys	948,068	272	272	100%
Engines, Marine	8,132,858	6,552,638	5,772,710	88%
Engines, Spare Parts	695,453	133,776	132,176	99%
Fenders	282,706	150,838	148,064	98%
Life Floats	389,832	66,112	14,131	21%
Life Rafts	331,233	100,671	87,821	87%
Stanchions	157,788	7	....	....
Small Craft (under 30 feet)	590,903	467,546	239,970	51%
Steering Equipment	426,364	93,986	93,455	99%
Winches, Windlasses, Capstans	2,249,414	349,413	186,747	53%
Miscellaneous Special Ship Equipment	1,333,784	551,893	539,834	98%
	$20,445,057	$11,599,746	$9,385,275	81%

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
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Among those gathered in memory of J. Howland Gardner at the launching were (left to right): Homer L. Ferguson, president, Newport News Shipbuilding & Dry Dock Company; Admiral George H. Rock, Administrator, Webb Institute of Naval Architecture; F. D. Herbert, partner of Kearfott Engineering Company; Mrs. George Elkins, sponsor of vessel; H. Gerrish Smith, president, Shipbuilders' Council of America; John F. Metten, chairmon, New York Shipbuilding Corporotion, Comden, N. J.; W. S. Newell, president, Bath Iron Works Corporation; and Andrew B. Sides, president, New England Shipbuilding Corp.

NOTABLE CHRISTENING AT NEW ENGLAND SHIPBUILDING CO.

In tribute to the memory of the late J. Howland Gardner, former president of the New England Steamship Company, a past president of The Society of Naval Architects and Marine Engineers, and for the past 15 years a consultant for Kearfott Engineering Company, friends, business associates and past presidents of The Society attended the christening of the aircraft cargo Liberty ship, J. Howland Gardner, at the plant of the New England Shipbuilding Corporation, South Portland, Maine. Mrs. George W. Elkins, daughter of Mr. Gardner, christened the ship.

In addition to members of Mr. Gardner's immediate family, the launching party included W. S. Newell, president, Bath Iron Works Corp., and president of the naval architects society, as well as George G. Sharp, naval architect, New York; James B. Hunter, chief naval architect, Bethlehem Steel Company, Shipbuilding Division, Quincy, Mass.; Martin L. Katzenstein, New York; Frederick D. Herbert, Joseph E. Garabrant and Fred D. Herbert, Jr., partners of the Kearfott Engineering Company. Also members and past presidents of the Society were present.

A library of 400 volumes, donated by friends and associates of J. Howland Gardner, was presented by Frederick D. Herbert, president of the Kearfott Engineering Company, to the new ship through Andrew B. Sides, president of the New England Shipbuilding Corp.

WORD HAS JUST BEEN RECEIVED in San Francisco of the marriage of Ensign Henry F. Grady, Jr., to Army Nurse Lieutenant Rebecca Erwin. The wedding took place August 22 in the chapel of the U. S. Army hospital at Charleston, S. C., highlighting a romance that began when the young people first met while serving aboard the hospital ship Ernest Hinds in the Mediterranean area.

Ensign Grady is the second son of the Henry Francis Gradys of San Francisco.

Steady As You Go!

(Continued from page 613)

porary positions". (An opinion of the United States Attorney General, as to government "temporary positions" is added at the end of this article.)

The Act applies only to positions with the Federal Government and positions with private employers. There is nothing in the Act which gives a discharged member of the Merchant Marine or the United States Maritime Service any right to reinstatement to a position which he formerly held with a State, or any political subdivision thereof—County or City. **All Congress did in relation to position with States, Counties, and Cities, was to declare it to be the sense of the Congress that States, and political subdivisions thereof should restore such persons to their old positions**—States, Counties and Cities cannot be forced to reemploy such persons, and no legal action may be maintained against them to enforce any of the provisions of this Act.

(To be continued)

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton



USS Saratoga as she came in to San Francissco through the Golden Gate September 13 on her first peacetime mission. *Courtesy of S. F. Chronicle*

Welcome Home
QUEEN OF THE FLAT-TOPS

Through the Golden Gate return the "Best damn Army and Navy in the World." U. S. S. Saratoga, now a combination Flat-Top and U. S. Navy Transport, recently made her first peacetime calls, transporting to San Francisco thousands of veterans from the Pacific Theater.

Let us hope the "Gallant Lady" will visit us often during the next few months, bringing hosts of war veterans to be greeted on arrival by the big white slogan on Angel Island, "Welcome Home, Well Done."



Left to right: W. Russell, Dovid Currier, C. Mues (American Bureau of Shipping), Phil Fresia, D. P. Nilan, and B. A. Harrigan.



Rear row: J. H. Jacobson, C. Lee, D. Neilson, J. A. McMahon. Front row: J. Thomsen, A. C. Allen, all U. S. Maritime Commission Inspection staff.

Bethlehem Completes Another Big NAVY TRANSPORT

Pacific Marine Review Photographer Snaps a Few U.S.M.C. and Bethlehem Representatives on Trial Trip of Admiral W. S. Sims on September 20, 1945



Left: Windlass test, hoisting anchor. View of bridge superstructures looking aft from Fo'c'sle Deck. Pacific Marine Review inspects windlass control. Below: Sluicing the hawsepipe and chain.





Left: B. Watson, representative of Mundet cork.

Right: Captain Edward C. Holden, Jr., who commands the USS Admiral W. S. Sims for the Navy.

At bottom: David Neilson, Bethlehem-Alameda yard chief hull inspector, U. S. M. C.







Upper left: M. Weitzner, chief engineer, Bethlehem San Francisco and Alameda.

Upper right: G. Rushforth, Bethlehem-Alameda Engineering Dept.

Below, left: Captain E. Mohr, Bethlehem Triol Crew.

Below, right: D. P. Nilan and P. Fresia, U. S. Maritime Commission trial board.



Genial Gene Hoffman, secretary, and Bern DeRochie, prize awarder extroordinary.

Bill Bush following through.





Hugh Gallogher

Some of the San Francisco Propellers who toured the links.















Left to right: Byron and Harry Haviside. Center: Between the chefs is Joe Robertson; and on the right "Dad" LeCount and Byron Pickard, the gate passers extraordinary.

San Francisco Propellers Annual Golf Tourney

D. M. "Bob" Lillevand, boss man of the committee arranging the very successful 1945 Golf Tourney and Banquet for The Propeller Club, Port of San Francisco, is still receiving the plaudits of the one hundred and more men who came aboard for the annual event. Setting was the relaxful Lakeside Course and facilities of the Olympic Club.

John Greany proved the day's best golfer and was rewarded with the presentation of the Propeller Club's trophy and a crisp Victory Bond.

Banquet cuisine was most pleasing, thanks to the efforts of Joe Robertson and Rudy De Gorog, our own caterers de luxe. Eugene Hoffman handled the copious details of finance, reser-



At right: Gene Essner and Joe Gisler, Joe of Intercoastal Steamship.

Below, right: Honest Eddie Martin, handicapper who proved the moor man's friend as the official Propeller golf handicapper.

Below, left: McCormick Lines favorite caddy!









Above: Skipper Joe Moore, Jr., Harry Parsons bowed by the prizes, and John Clerico, part engineer with a hobby.

vations and "dead horse" collections with his usual secretarial skill.

High light of the evening's merry repast was the awarding of a kaleidoscopic array of prizes assembled by the Propeller's champion pitch artist, Bob Lillevand, Harry Parsons, Joe Marias and Bern De Rochie. Bern proved an excellent master of prize distribution and for two solid hours he showered lucky winners with Victory Bonds, bric-a-brac, glassware, crates of eggs and oranges, sweaters, golf paraphernalia and other plunder bestowed to the good cause by these noblemen.

Our thanks to these prize donors: George A. Armes of General Engineering and Drydock Co.; George F. Arata Co., Inc.; Allied Products Co.; John Greaney of Bethlehem Steel Co.; Dahl-Beck Electric Co.; Dohrmann Hotel Supply; Wm. P. Empey of "The Guide"; Roger Murray for Fairbanks, Morse Co.; Golden State Co.; Haas Bros.; Harry T. Haviside of H. T. Haviside; C. J. Hendry Co.; Edward L. Heuck Co.; Harlan Scott for "The Log"; A. Levy for J. Zentner Co.; Joe A. Moore, Moore Dry Dock Co.; M. and N. Distributors of Gears; Marine Electric Co.; C. W. Marwedel; O'Brien, Sportono, Mitchell and Compagno Bros.; Frank J. O'Conner of Donovan Lumber Co.; Harry W. Parsons; Pacific Paint and Varnish Co.; Poultry Producers of Central California; Pacific Marine Review; Joe Roberts & Co.; S & W Fine Foods; Schweitzer & Co.; L. T. Snow & Co.; Standard Distributing Co.; Sunset Produce Co.; Tiedemann & McMorran; Standard Oil Co. of California; George E. Swett as a salute to Major Jim Swett; Robert D. Spear; Tom Short, Thos. A. Short Co.; Herman Nichols for Tubbs Cordage Co.; Weeks, Howe & Emerson, and The Young Company.






Familiar faces a the banquet members of th Port of San Fran cisco.

Memorial Cornerstone Laid—C. M. A. Class Is Graduated

Fred L. Doelker, vice president of the Grace Line, as principal speaker at the graduation class for 36 Midshipmen who will serve with the Merchant Marine, and at ground-breaking ceremonies for the new $2,000,000 buildings to be constructed at the California Maritime Academy at Vallejo, told the future officers of the American Merchant Marine that never before in our history has the sea offered such opportunities for young men to make the sea a career.

It was announced by Captain Claude B. Mayo, USN (ret.), superintendent of the Academy, that "These new buildings will further supplement the training Midshipmen now receive aboard the training ship Golden State, and will make it possible for the school to graduate 200 officers for our merchant fleet each year."

Open to young Californians between the ages of 17 and 23, the Academy was established under the State Board of Education in 1929. During the war 71 Masters and 59 Chief Engineers came out of the ranks, and all graduates are now serving the shipping industry. Nine officer graduates lost their lives during the war and two were prisoners of the Japanese.

With the completion of the new buildings, the California Maritime Academy will resume its regular three-year course, which will graduate Midshipmen with licenses as Third Mate or Third Assistant Engineer in the Merchant Marine and commissions as Ensign in the United States Maritime Service. In addition, a degree of Bachelor of Science can be achieved during the course of study.

The graduation exercises, which followed the ground-breaking ceremonies, saw 36 Midshipmen receive their licenses and commissions. The exercises were attended by leading Merchant Marine, Naval and shipping officials, including Rear Admiral Mahlon S. Tisdale, USN, Commandant, Mare Island Navy Yard; Captain H. J. Tiedemann, USMS, War Shipping Administration; and Frazer A. Bailey, president of the Matson Navigation Company.



As a memorial to the 11 graduates killed in service, the cornerstone of the first new permanent building of the California Maritime Academy was laid. Left to right: Rear Admiral Mahlon S. Tisdale, USN, Brigadier General Victor R. Hansen, Captain Claude B. Mayo, Retired; and Captain H. J. Tiedemann, USMS, participated at the ceremony.

Marine Personnel Needed in Army's "Navy"

There is still a lot of work to be done at sea before our boys are all home. The Army Transportation Corps, the Army's "navy," is calling for more marine personnel to man transports and small-craft at and between its ports and oversea bases.

Two hundred openings are available immediately for qualified mates, diesel engineers, able-bodied seamen and oilers, Major Homer Lunt, chief of Vessel Manning Section at San Francisco Port of Embarkation, announced.

In addition there are jobs and schooling waiting for youths wanting to learn about seamanship by starting as deckhands. The school is at New Orleans and those between the ages of 16 years, 10 months, and 17 years, 2 months, accepted for deckhand work will be trained at New Orleans for five weeks before being assigned to duty within San Francisco Port.

"Although hostilities have ceased in the Pacific, San Francisco Port of Embarkation is still busily engaged in sending supplies and soldier replacements overseas and in returning soldiers to their homes for discharge," said Major Lunt, "and a large number of marine workers are needed to help finish this job faster."

Men or youths interested in this work are requested to report to Vessel Manning Section, Building 141, Bay and Laguna Streets, Fort Mason, for interviews.



Victory Picnic at Alameda Station

EVERYONE HAD FUN at the victory picnic, held September 9 at the Officers' Training School at Alameda, California. For evidence, look at these photographs. Upper left, Clyde Diaz and Norman Hanley go through their aqua-antics. Next, national indoor champ, Zoe Ann Olson, executes the swan dive. Then, Dan Roberts, of the station, does some shooting. At right, Richard Bartalini munches a hot dog. In the next row, Captain Crossman and his guests, Mr. and Mrs. Ken Stacey. The finish of the boat race, with a deck section winning. Inset is of Gene DeAlessi, S1 c, a master of ceremonies. On the right everybody eats, including baby. Below, youthful spectators thrill to a softball game, in the next panel. And on the right, CHOW!



Head table at September 11 meet of the WOAMM's—Left to right: Mrs. Babb; Mrs. Allan Toole, vice president; Mrs. Paul Crank; Captain M. E. Crossman; Mrs. Frank Short, president of club; Lieutenant Commander O. J. Sipe, in charge of Training Aides and Scheduling at Alameda school.

Training Film Shown WOAMM's

Guests and members at the September meeting of The Women's Organization of the American Merchant Marine were enlightened on the "Life and Studies of an Officer Candidate," through a technicolor film presented by Captain M. E. Crossman, superintendent of the Alameda Officers' Training School and honored guest of the WOAMM's. Captain Crossman had as his guest Lt. Comdr. O. J. Sipe, who is in charge of training aides and scheduling at the school.

This film is not put out for publicity purposes, but is shown to the prospective Officer Candidates for orientation and shows the Candidates only in training during the four months period. Each Candidate arrives with a requisite of 14 months sea experience in the Merchant Marine. After they leave the school they are licensed ship officers. Since the school has been in operation more than 6000 Merchant Marine officers have been commissioned at the Alameda Station.

Now that the war is over, restlessness has affected everybody, but particularly those in the shipping industry. U.S.M.C. and Congress have not decided what they are going to do. How many ships will be necessary for post-war shipping; how many lines will be in operation? These questions are still unanswered and are affecting the morale of the officers and men, especially those still in training. Any help to bolster their morale through this transition period is well worth while as these are the men who make or break our future trade prosperity, and who help the accelerated discharge program whereby thousands of veterans will be returned to this country.

Below, right: Captain Crossman explaining to the Women's Organization the officer-candidate training, prior to showing the School's film.





Captain M. E. Crossman, superintendent of Officers' Training School at Alameda, has just bought a series of chances on the raffle of the painting "Rolling Home" sold by Mrs. Harry W. Parsons, in charge of Raffle for the Women's Organization. The painting is by a merchant seaman who received honorable mention during last year's U. S. Seamen's Art Exhibit held in New York and San Francisco and is to be raffled soon in San Francisco.



A. G. Sathoim, general superintendent of United States Lines aboard the Reeving Eye.



Dr. Richard Maare of Permanente Hospital.



Captain Kolbe of the U. S. Lines, commander of the Reeving Eye built by Kaiser Company's Yard 4.

Sea Trials of the M. S. Reeving Eye

Built at Kaiser Cargo Co., Inc., Yard No. 4 for War Shipping Administration and Operated by United States Lines.

A member of P.M.R.'s staff attended the sea trials on September 25, 1945, of the Motorship Reeving Eye, known as a C1-M-AV1, a coastal cargo vessel built by Kaiser Cargo, Inc., at Richmond, shipyard No. 4. She is built for the United States Maritime Commission and operated under the W.S.A. by the United States Lines. The delivery of this vessel marks the completion of a contract for 24 of these ships built under the U.S.M.C. supervision for the U. S. Navy and the W.S.A.

The principal details of the vessel:

Mr. Buttner, of Scott-Buttner Co.



length 338′ 6″; beam 50 ft.; depth, 29 ft.; draft 18 ft.; deadweight capacity 3840 tons. She is propelled by a single screw, driven by a Nordberg diesel of 1750 hp at 180 rpm. The hull and machinery of the U.S.S. Alamosa, the first vessel of this type completed by the builders, Kaiser Cargo, Inc., was fully described in the September, 1944, issue of this publication.

The vessel performed entirely satisfactorily while undergoing the following tests: anchor windlass test,, emergency steering test, gyro-pilot steering test, 10 per cent overload power run, ahead steering test, 25

Chas. Cunningham, yard 4 manager, with Miss G. Adams, the sponsor of the Reeving Eye.





Front row, left to right: John L. Fennie (USMC), Electrical Inspector; Edward Hollister (USMC), Hull Inspector; Earle W. Harne (USMC), 1st Senior Machinery Inspector; Wm. Kertell (USMC), Electrical Inspector.

Standing: Edward P. Finnegan (USMC), 1st Senior Electrical Inspector; James W. Smith (USMC), Head Machinery Inspector; Chas. Cunningham, Asst. Gen'l Supt., Kaiser Yard 4; Alex F. Marshall (USMC), Head Hull Inspector; Carl Vogt (USMC), Senior Hull Inspector.

per cent overload power run, emergency astern test, full speed astern run, astern steering test, emergency ahead test.

In addition to the U.S.M.C., U. S. Coast Guard, American Bureau of Shipping inspection staffs, and the operating administrative and technical personnel of Richmond Yard No. 4, the following guests from the launching sponsor's party were on board: Miss Eudora Evelyn Adams, sponsor; Mrs. Jack Wooll, matron of honor; Miss Marge Keith, flower presentation. Guests included: Mrs. Alex F. Marshall, Mrs. Ben Seaborn, Mrs. G. M. Ellis, Mr. and Mrs. Ed Buttner, Mr. and Mrs. Reginald Machado, Walter Ramage, Mrs. A. M. Underkoffler, Captain and Mrs. Robert Moford, Mrs. John Mier, Mr. and Mrs. Leonard Harrington, F. W. Crocker, Mr. Sheldon, Mr. and Mrs. Wm. Stone and R. Nawman.

Upper, right: Walt Hensolt, triol run superintendent, at left, with Captain Michaelson, at right, trial captain, and William Eastan, mate.

Below: John Sheridan, personnel manager at Yard 4, and Marjorie Keith, Yard 4.

Below, right: Mr. and Mrs. D. Williams and Mr. and Mrs. A. Marshall.







U. S. M. C. Fetes





On Top: CHARLES STEWART, head Hull Inspector, standing at the piano while Harry Taylor accompanies.
PAUL MULVANY (stonding) takes a bow. Vigoreus applause by Charlie Nolan (side to camera), Bill Anderson and Al Brown.

The United States Maritime Commission construction offices in the field and at regional office, Oakland, honored L. R. Sanford, director of construction for all United States areas, by tendering him a reception and dinner at the restaurant, El Jardin, in San Francisco on September 5.

The following principal hull, machinery and several electrical inspectors, together with certain officials of regional office, and also from Admiral Shea's office of Guarantee Surveys were in attendance. Included in the group were David Currier, chief inspector of Pacific Coast; Paul N. Mulvany, Ben Carter, E. S. Shulters, Clyde Miller, E. L. Swain, Admiral W. H. Shea, Harry B. Taylor, W. Quarg, John F. Hayes, J. A. George, C. J. Nolan, W. Manuel, Ed Ring, Chester Nelson, W. Fawke, L. Stephens, James Kastrosky, Charles Stewart, James Carroll, W. Anderson, Al Brown, M. Chamberlain, Roy Shipley, Ed Finnegan, James Smith, Alex Marshall, J. Hamilton, L. Eakin, W. Russell, David Neilson, A. C. Thompson, W. Craig, A. Nield, Earl



JOHN F. HAYES, Chief, Administrative Section.



Left to right: E. L. Swain, Engineering Plan Approval; E. S. Shulters, technical assistant to Director L. R. Sanford; and Clyde Miller, chief, Personnel Section of the U. S. Maritime Commission.

New Director

Horne, John Pugh, W. Hiefield, H. C. Ritterson, J. F. Johnston, and A. V. Smith.

Most of these gentlemen were known by Mr. Sanford when he was formerly Chief of Construction for all United States regions.

It was a spontaneous and happy party with speeches, music and songs. Mr. Sanford responded to all toasts and remarks extended to him in his usual sincere and frank manner.

Everyone has expressed his great pleasure in meeting Mr. Sanford, all good luck and their cooperation in anything they might do in any future work ahead under Mr. Sanford.



The two jovial gentlemen are David Currier, and L. R. Sanford, Director of the U. S. Maritime Commission, taken at the luncheon tendered Mr. Sanford by the West Coast Regional office in San Francisco.

Below, left (left side of table): Charles Stewart, James Kastrasky, Louis Eakin, Harry Rittersan, W.S.A., John Johnstan, Alex Marshall, William Russell, and David Nielsan; (right side of table) James George, Rupert Smith, Chester Nelsan, Edward Finnegan, A. S. Thampson, Bill Hiefield, William Fowke, and W. H. Quarg. David Currier, standing.

Below, right (left side of table): Harry Taylor (back to camera), Paul Mulvany, C. J. Nolan, James Carroll, L. G. Stephens, Morris Chamberlain, and James Smith; (right side of table): Alfred Brawn, William Anderson, Ray Shipley, James McMahan, Edward Ring, and Benjamin Carter.







Carl Flesher Joins Executive Staff of Hendy Iron Works

Carl Flesher has joined the executive staff of the Joshua Hendy Iron Works, effective September 1, it was announced by Charles E. Moore, president of the company, and is serving as an assistant to the president, dealing with special engineering and sales projects for Hendy.

He was formerly West Coast regional director of the United States Maritime Commission and has an extensive background in engineering.

HAILED AS "MARINE PAINT TRIUMVIRATE"

What is hailed as an ideal "marine paint triumvirate" has been formed by three men prominent in the industry on the Pacific Coast with George Nagel and Edward Whittemore assuming ownership, and Knox Price the management of the Atlas Paint and Varnish Company, with factory located at 1922 East Gage Avenue, Los Angeles.

It is the unique case of a well-known and experienced marine paint chemist, an office manager and purchasing agent, and a live-wire waterfront sales manager combining forces in the operation of a well-equipped and well-staffed organization.

George Nagel, widely recognized as a chemist who has been responsible for many improvements in formulas for marine paints, varnishes and enamels, is the factory production "brains" of the trio. Nagel, who has spent 32 years in research, tests and production, was formerly with a marine paint company in San Francisco, having served as technical director for that firm.

Knox Price, past president of the San Francisco Paint, Varnish and Lacquer Association, knows the business inside out, has held many executive positions in the industry and was for nine years purchasing agent of the American Marine Paint Company.

Popular with ship operators of the Pacific Coast and well known to yachtsmen, men of the ship repair yards and fishermen, Edward Whittemore has spent the past 15 years on the waterfront as paint salesman. His vast acquaintance among the shipping fraternity and his complete understanding of their paint problems makes him an ideal "contact man" for the Atlas organization, which is already strongly entrenched in the marine paint field.

The Atlas company features among its marine paints, anti-corrosive and anti-fouling compounds and inhibitive primers, which represent years of tests and production on the part of George Nagel and his assistants who are entirely familiar with the paint problems of operators of both wooden and steel hull ships.

MARINERS AHOY!

Plan to attend the big VICTORY DINNER & FROLIC, Wednesday, October 17, in the Gold Ballroom at the Palace Hotel in San Francisco. It's strictly informal, starting with cheers at 6:30 p.m. and dinner at eight.

HEAD PACIFIC COAST FIRM

Three men, long prominent in the marine paint industry on the West Coast, have assumed ownership and management of the Atlas Paint and Varnish Company at Los Angeles. They plan a large post-war expansion program. (Left to right): Edward Whittemore, sales director; George Nagel, paint chemist and production chief; and Knox Price, office manager.



Oldest Ship Chandlers' Firm Sells Out

NEWS THAT THE DIRECTORS of the C. J. Hendry Company, one of the largest and oldest ship chandlers and manufacturers representatives in the country, have agreed to sell their holdings to a group of local capitalists headed by Jay Levine. The news created a sensation when it became public in West Coast maritime circles. The concern, established in 1865, had their principal business operations in the West, but the firm was known throughout the world.

When the negotiation of sale was revealed there was no announcement as to whether there would be important changes in management personnel.

This marks the second large business investment by the Jay Levine group in California, having purchased last year the Juillard-Cockcroft wholesale grocery and liquor chain which does in excess of $15,000,000 business per year.

In a statement to the press, Jay Levine expressed his confidence in the future of both businesses and the part they will play in the great postwar future of this State. This business has state-wide coverage. The main office of this company is in San Francisco, with branches in San Diego and San Pedro. Over $2,000,000 was involved in the transfer.

The C. J. Hendry Company have just issued and now have available for distribution a new 600 page catalog in an attractive gold and black cover. This new catalog covers thousands of marine items and is the most comprehensive and complete catalog of ship chandler's supplies ever issued.



INGALLS PRESIDENT VISITS JOSLYN & RYAN

Manroe B. Lanier, president of Ingalls Shipbuilding Corporation, was in San Francisco recently to confer with the naval architects, Joslyn and Ryan. P.M.R.'s cameraman happened in during this conference and took this photograph of Mike Ryan, left, explaining a detail to Mr. Lanier, while Paul Joslyn looks on. On the wall are plans that J & R are working on for Ingalls.

WELDING SPECIALIST FOR BAY AREA: Edgar W. Bartz, formerly of East Pittsburgh and Trafford, Pa., has been appointed welding specialist for the San Francisco Bay Area by the Westinghouse Electric Corporation. Announcement of the appointment was made in San Francisco by Frank E. Bodine, San Francisco manager.

In his new post, Mr. Bartz will have charge of all Westinghouse activities having to do with the promotion and use of electric welding in the San Francisco Bay Aea.

GAYLE R. DUTTON OF WESTERN FIBERGLAS Supply, Ltd., announced the opening of a manufacturing and service branch of his company in Oakland on September 1 at 526 Third Street. Manufacturing and fabricating operations, including the special size Fiberglas dust stop filter manufacturing department, were moved from San Francisco to Oakland, and the 10,000 square feet of floor space in the new branch provides ample warehousing facilities to serve the company's rapidly increasing number of Fiberglas customers in the east and north bay areas.



SILVER BRAZING FOR COPPER AND BRASS

In the "Industry on Parade" exhibit at The Industrial Exposition in Los Angeles' Pan-Pacific Auditorium in early September, one of the most attractive displays was this showing of silver alloy brazing of non-ferrous metals.



The late John W. Chapman, vice president, Grace Line.

Grace Line Official Passes

John W. Chapman, vice president of Grace Line Inc., died suddenly September 8 at the family residence in New York City.

Mr. Chapman was born in Corvallis, Oregon, November 11, 1884. He was educated and spent his early life in Portland, Oregon. Thirty-five years ago he entered the steamship field—operating steamships between California and the Panama Canal and engaging in intercoastal trade. Later he was engaged in the general steamship agency business also operating freight and passenger vessels in the Pacific coastwise trade, and in addition represented other companies engaged in intercoastal, offshore, and coastwise business.

He moved to New York in 1931 to join the Grace Line as vice president in charge of traffic. This was just before the four luxury liners, the "Santas" Rosa, Paula, Lucia and Elena were added to the Grace Line fleet of passenger and freight ships.

Entering the company at that period, Mr. Chapman played an important role in the introduction of deluxe passenger service from New York to the west coast of South America and also to Central America, Mexico and California—the first such deluxe services to be operated on those routes. He also took an active part in the preparatory investigations and arrangements for Grace Line's Caribbean service and later, in 1937, in its establishment.

In the capacity of vice president, he handled passenger and freight traffic on all the Grace Line routes and traveled extensively in the Caribbean, Central and South America. He was very well-known in steamship circles and enjoyed wide popularity.

He was a member of India House and the Traffic Club of New York.

A Gadgeteer Revolutionizes The Army

When Uncle Sam began to tap the resources of the country for material with which to meet the many challenges of the war, he probably didn't expect to get much more from the decorative arts than propaganda posters, service club murals, and training aids.

But three years ago, in San Francisco Uncle Sam ran into a veritable font of mechanical ingenuity that at the time was turning out hand-sculped pieces and an occasional oil. As a result, the War Department is the possessor of a list of mechanical gadgets and training aids which have speeded the repair work of the Quartermaster and Ordnance branches.

The artist responsible is Edward E. M. Joff, former sculptor and painter now with the Civilian Training Section at the San Francisco Port of Embarkation. His latest invention, a "psycho-physical" test for drivers of vehicles and cargo handling equipment, is now in the hands of the Post Engineer for drafting.

Simple in construction, as are all of Joff's inventions, the device involves an electrically lighted board with a series of holes in graduated sizes that simultaneously test for color blindness, steadiness of hand, and coordination of hand and eyes.

Another invention, and one that eventually is likely to have wide application in industry, is a soldering iron with an attachment that feeds

(Continued on Page 94)



Edward E. M. Jaff (left) of the Civilian Training Section, San Francisca Part of Embarkatian, explaining his latest brain-child to Capt. Christian S. Heritage, Assistant Part Engineer, in charge of the Drafting Department at Fart Masan.

U. S. Maritime Service Officers' School
OF ALAMEDA
GRADUATING CLASS OF SEPTEMBER, '45
(Deck Officers Section)



First raw, left to right: William Suich, Harold Elsensohn, George Cleland, Curran Dempsey, Ensign Edward Hurlbut (Section Officer), Charles Wiley, Martin Tarpey, Carl Wickwire, Thomas Price. Second raw: Mark Feltan, Kenneth Bowyer, Harold Johnson, Robert Graves, Robert Elsensohn, James Bixler, Gale Leifer, Charles Welch, Benjamin Pryor, Donald McManis.



First raw, left to right: James Braun, Rajer Maens, David Twigg, Elmer Stump, Lt. (jg) Albian Howe (Section Officer), Frederick Crawhurst, Colin Darroch, Ralph Cantrell, George Guntermann. Second row: Glenn Bernhardt, Robert Crawford, John Pirnie, Louis Schiavon, George Pendergrass, Thurlan Taylor, James Van Landingham, James Gahan, Larry Lincoln, James Braghetta.



First raw, left to right: Harvey Weaver, Philip Ritter, Thomas Darling, Ensign William Milgate (Section Officer), Joseph Warren, J. B. Seevers. Second row: Howard Hauchard, Hans Gleason, Donald Biggs, Robert Jaqua, Karl Johansson, Robert Andersan, Karl Kehm.



First raw, left to right: Norman Andersan, Charles Baecht, Melvin Goddard, Lieut. James Van Dyke (Section Officer), Theadore Bentas, Theodore Maldenbauer, Robert Moats. Second raw: Robert Turner, Ralph Cards, Bruce Pearsan, Allen King, William Kessan, Francis Johnsan, Billy McDaniel. Third row: Charles Brawn, Paul Rachal, Harald Coffman, Richard Jahnke, Joseph Griggs, Llayd Headrick, Frank Brandel, William Lyons.



Engineering Section

First row, left to right: Paul Potter, Harry Ritchie, Bernard Selinske, Ensign Charles Abraham (Section Officer), Norman Teeples, Harve Flake, Ernest Pyatt. Second row: Hugh Commiskey, Svend Outzen, Henry Garcia, Calvin Cameron, Newman Roman, George Read, Henry Keron. Third row: Dennis Syltabo, Francis Sorenson, Bill Drane, Albert Pratt, Ridgley Law, Curt Meyer, Donald Kinser, Wendell Hall.



First row, left to right: Archie Erickson, Darnell Brogan, Kenneth Howley, Ensign Theodore Hansen (section Officer), Carl Larsen, Clayton Leard, Harold Inmon. Secand row: Marvin Allen, Louis Efremsky, Robert Oliver, Jack Randalph, Fredrick Douglas, Estol Swan, James Hare, Ray Brown. Third row: Edwin Farrell, Harold Green, William Nanney, Richard Krause, John Ballard, Glen Springer, William Buttolph, William Scanlon.



First row, left ta right: Paul Kahl, John Badily, Ward Bagley, Lt. (jg) Richard Juhre (Section Officer), Floyd Robertsan, Henry Halmes, Thomas Sanquinetti. Second row: Robert Ribali, Kenneth Tucker, William Bennett, William Hendrix, Dea Hardenbraok, Melvin Huxtable, Richard Monak. Third row: Robert Moare, Alfred Burgess, J. D. Williams, Leon Fussell, Frank Graeber, Travis Owen, Narman McLood, Stanley Corrier.



First row, left ta right: John Bussard, Andrew Galuppe, James Dovies, Alexander Fox, Lt. (jg) Jaseph Lewis (Section Officer), Emery Rentfra, William Pilgrim, James McDonaugh, Shermon Melvin. Secand row: Richard Abblitt, Ernest Galgocy, Dawsan Needham, Antoni Jensen, Richard Hayes, Raymond Swartz, Howard Nichelman, Gerard Sessians, Joseph Davy. (Donald Tharsen, absent.)

U. S. Maritime Service Officers' School

OF ALAMEDA

GRADUATING CLASS OF OCTOBER '45

(Deck Officers Section)



First row, left to right: Joseph Gang, George McClintock, Melvin Vanalstine, Ensign Ethan Allen (Section Officer), James De LaMontonya, Cleo Davis, Dexter Wilberg. Second row: Kenneth Word, William Konevich, Don Roberts, Howard Barnes, Edward Hulecki, Wallace Stenlake, Armond Salmanson, Indolecio Sanchez. (Grand Bliss, absent.)



First Row, left to right: Anson Bowen, Eugene Kjeshu, Howard Glidden, Frederick McDonell, Lieut. Edgar Larsen (Section Officer), Arthur Shipway, Gustave Hoehne, Darrell Jones, Alexjandro Marquez. Second row: Scott Glover, Harold Thompson, John Soules, Victor Presco, Peter Livingston, Burton Avery, Arthur Adams, William Zuver, Robert St. Clair.



First row, left to right: William Harriman, John Choppell, Eugene Okey, Richard McFarland, Ensign David Sturgeon (Section Officer), Russell Shearin, Owen Darnell, John Molloch, Harold Kortum, James Shubart. Second row: Therwold Hollstrom, Harold Ballou, Frank Merrill, Rolland Larson, Milton Armstrong, Carl Binford, Lude Pedersen, Jarrell Bentley, James Giblin, Stuart Goldthwaite.



First row, left to right: Ralph Bateman, Dorrel Lang, J. H. Canipe, William Wilken, Lt. (jg) Raymond Bjorkquist (Section Officer), Harold Petersen, Mitchell Lewis, Edward Hansen, Glenn Jordon. Second row: Robert Stork, Miner Richardson, Lloyd Heger, Jim Siburg, George Lunn, Charles Chick, Conrad Larsen, Jack O'Connor, Herbert Sonquist, Donald Moss.



October Engineering Group

First row, left to right: Frank Reyes, Miguel Bernal, LaVern McCraskey, Arthur Santoianni, Lieut. Walter Tamghe (Section Officer), Elmer Lantz-Loos, Richard Clark, Melvin Decoy. Second row: John Beutgen, Glen Storm, Neal Gardon, Walter Slayton, Clyde Hammer, Claude Gammel, George Voelker, Harvey Hoovler, Lloyd Rallings.



First row, left to right: Paul Crane, Thomas Kelly, Frank Hughes, Lt. (jg) Robert Drew (Section Officer), William Nelson, Chester Sargent. Second row: Kenneth Sandersan, Otto Kelley, Jessie Richardson, Robert Swift, Prentice Neel, Alvin Goldman, Charles Bachmann. Third row: Robert McDowell, Jackie Prestan, Eugene Gortland, Martin Muir, Kaj Blamquist, Carl Bauman, Virgil Compbell, Robert Buhler.



First row, left to right: William Whitman, Jerome McCann, Ralph Graves, Lt. (jg) John Rizzari (Section Officer), David Kikkert, Charles Oliverius, Hazen Bair. Second row: Charles Aro, Joe Rooche, Raymond Gaudinier, John Morris, Elmer Mehrer, Kenneth Edmonds, Donold Reed, Henry Gratis. Third row: Roymond Jones, Howard Ten Broeck, Charles Blaam, Herbert White, Harold Kinney, John Babcock, Robert Hungerford, Philip Kaenigsberg.



First row, left to right: Arthur Bley, Edgar Morningstar, Vollier Tampkins, Lt. (jg) Leroy Kayser (Section Officer), Earl Viertel, Richard Robinson. Second row: Lyle Case, Humphrey Payton, William Lemming, John Huff, Charles Kramer, Jerome Daniel, Edwin Caulk. Third row: Edword Simmonds, James Register, James Caldwell, George Johnsan, Richard Lawrey, Gerald Fees, John Alley and John Lincoln.



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KNOW HOW
is Ready to Serve the World



CIW's "know-how" is a real and tangible thing. It is made up of men, machines, methods, management. It characterizes an institution where versatility and productive capacity have been proved. CIW's vast facilities are ready and available for postwar development of industry.

The story of this institution, the men and women who staff it, the facilities it has to offer industry, is told in a 48-page book just off the press, entitled "KNOW HOW ... two words that symbolize Commercial Iron Works"

"Know-How" tells of CIW's engineering and designing facilities and how they can serve you. It covers the vast and all inclusive construction facilities available at Commercial Iron Works. It gives a picture of every phase of CIW's operation including assembly, installation, distribution, service and sales that CIW is prepared to offer industry NOW! A copy of "Know-How" will be sent to you upon request! It will show you how Commercial Iron Works can help you develop the growing markets of the Pacific Northwest as well as the potential markets of Alaska, Russia, South America, The Orient and the lands beyond the Pacific.

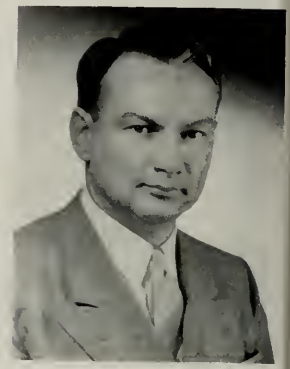


COMMERCIAL IRON WORKS

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CONTRACTORS, ENGINEERS, MACHINISTS, FOUNDERS, SHIPBUILDING, MARINE REPAIRS, DRYDOCKING

Shoreside Personalities



G. L. Crow appointed G-E's San Francisco district manager of Marine Section.

NEW G-E MARINE SECTION MANAGER. Appointment of G. L. Crow as manager of the Marine Section of General Electric's Pacific District Industrial Division, effective September 1, has been announced by A. G. Jones, manager of the Pacific District for the Company. **C. M. LeCount** has been appointed consultant to the Marine Section. These are newly created offices to facilitate the handling of the company's contracts with the marine trade in the West. Both men will make their headquarters in San Francisco.

C. M. "Dod" LeCount, General Electric Co.





OFFICIAL U. S. NAVY PHOTO

Any port in a storm ... but there are no ports

More than one sailor has said, "It's a helluva place to fight a war!"

That's a miracle of understatement when you know the Pacific as well as the U. S. Navy knows it.

They know how many thousands of miles you have to go before you reach the fighting fronts.

They know there's almost continual rain and bad weather to hamper operations after you get there.

And they know there are no good ports!

Think of the thousands of ships, and the millions of tons of supplies it takes to keep our fighting forces moving toward Japan.

Imagine, if you can, the problem of handling those ships and supplies with no port facilities.

There are no giant cargo cranes... no miles of docks and warehouses...nothing but beaches, and human backs, and a refusal to call any job impossible.

Remember, too:

It takes 3 ships to do the supply job in the Pacific that 1 ship can do in the Atlantic.

It takes 6 to 11 tons of supplies to put a man on the Pacific battleline, and another ton per month to keep him supplied.

It takes a supply vessel, under ideal conditions, half a year to make one round trip.

Add up those facts, multiply by the number of sailors, soldiers, and marines for whom the Navy is responsible.

Maybe you'll begin to realize what "no ports" can mean in the rough, tough waters of the Pacific.

Maybe you'll see that we have *two* reasons to be proud of the U. S. Navy. *First*, the way they've sunk the enemy's ships.

Second, the way they sail *your* ships ... taking the worst the Pacific can hand them... but keeping the supply lines open ...keeping the attack *on schedule!*

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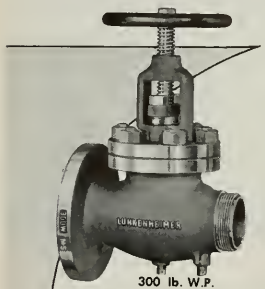
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Standardize On

LUNKENHEIMER VALVES

for Dependable

MARINE SERVICE



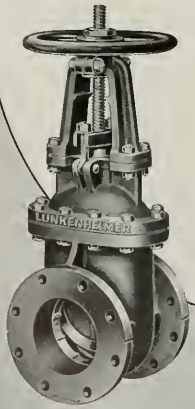
300 lb. W.P.
Bronze Hose Globe

The symbol "MS" on a Lunkenheimer Valve is a positive guarantee of efficient, long-life Marine Service, at exceptionally low maintenance cost.

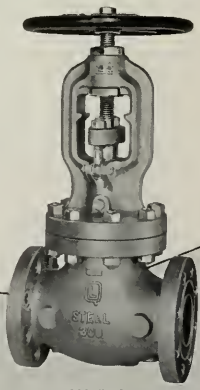
These quality Valves conform in every particular to Marine rules and regulations. Available in wide variety . . . valves of bronze, iron or steel . . . for all Marine service conditions and all prevailing pressures and temperatures.

Available through established Distributors, located in the nation's shipping centers.

The Lunkenheimer Co., Cincinnati 14, Ohio, U.S.A. [Offices: New York 13, Chicago 6, Boston 10, Philadelphia 7. Export Department: 318-322 Hudson St., New York 13, N. Y.]



125 lb. S.P.
Iron Body Gate



300 lb. S.P.
Steel Globe

LUNKENHEIMER VALVES

BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S. P.; BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS



C. H. Lundegaard, joins Aetna Marine Corporation.

NOTED N. A. JOINS AETNA. C. H. Lundegaard the former acting regional director of construction of the U. S. Maritime Commission's Eastern Region, joins the Aetna Marine Corporation, subsidiary of Aetna Steel Products Corporation, on October 1, 1945, as vice president.

After finishing school, Chris Lundegaard entered the employ and served a five-year apprenticeship in the shops and drafting rooms of the famous Burmeister & Wain shipyard in Copenhagen, Denmark, following which he became a hull draftsman and ship repair estimator. In February, 1920, he came to America and entered the employ of the Federal Shipbuilding & Dry Dock Company, in Kearny, New Jersey.

In 1938, he joined the United States Maritime Commission as a naval architect and advanced rapidly to the position of acting regional director of construction.

He is a member of the Society of Naval Architects and Marine Engineers, the American Society of Danish Engineers, the Danish Officers Club and the Society of Professional Engineers.

PHILIP CAREY PROMOTIONS: Three promotions within the sales divisions of the Philip Carey Mfg. Co. were announced September 1 by E. W. Smith, vice president in charge of sales. In Montreal will be Eric W. Hammarstrom as sales manager. As assistant to Mr. Smith is R. W. Galloway, who has been merchandising manager of dealer sales at Carey for the past year. Walter E. Hess becomes merchandising manager of dealer sales.

12 advantages in 1 joiner material !

J-M MARINITE—
attractive, durable, economical—
for all modern ships



As a joiner material for all accommodation and public spaces, Johns-Manville Marinite brings beauty, comfort and quiet. Its flat surface can be painted, or finished with wood veneer and other facings.



Lightweight panels are easy to handle. Marinite is rugged, homogenous, made of asbestos fibre with an inorganic binder. Will not burn; does not deteriorate under high humidity or mold conditions.



Cutting is no problem. Marinite can be cut with a carpenter's saw or lightweight electric saw. The ease with which it can be fitted reduces installation time.

- Light Weight
- Fireproof
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- Easy to cut and fit
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- Long life

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Specify **Johns-Manville** **MARINITE & Marine Sheathing**



SHORESIDE PERSONALITIES

En Route to South America

To interview growers and shippers, business and industrialist interests, in port cities and principal business centers in Mexico, Central and South America, **Harry Thompson**, freight traffic manager for the Grace Line, is en route to Latin America on an air trip of more than 25,000 miles. He will be away several months.

Purpose of his visit, according to Fred L. Doelker, vice president of the Grace Line, is to secure all possible information and needs of interests in the Spanish Americas regarding tonnage space, frequency of sailings and other marine matters for the concern's post-war steamship service, which will be established in the near future.

All during the war, Grace Line has maintained limited service under War Shipping Administration direction. The Grace interests have served these countries for more than half a century with modern passenger and freight steamers.

Thompson, before his trip, had toured the eleven Western States to ascertain the opinions of interests in these States, doing business with the Latin American countries, in order that he might so inform the growers and shippers of those countries.

Among places to be visited by Thompson will be Mexico, Guatemala, Salvador, Nicaragua, Honduras, Costa Rica, and the Canal Zone, in Central America. Thence to Colombia, Ecuador, Peru, Bolivia and Chile in South America.

Grace Line will assign new, fast "C" type vessels from Seattle, San Francisco and Los Angeles to the Spanish Americas, Doelker reported, just as soon as WSA regulations permit.

Workers Praised at Western Pipe & Steel

COMMENDATION TO THE WORKERS of the Western Pipe & Steel was received in a letter from Harry A. Rosek, chief engineer on the SS Sea Ray, to George D. Williams, Outfitting Superintendent of W. P. & S., on the vessel's performance.

The Sea Ray voyaged for 75,000 miles by July 31, after one year's operation. During this entire time the advices state there were no major repairs on the ship. The letter said that the few minor routine repairs have been administered by the crew and never has the vessel been delayed because of engine trouble.

The average fuel consumption to date, according to Chief Rosek, is 0.625 pounds fuel oil per shp hour. The vessel is one of many sent down the ways from Western Pipe & Steel for the account of the United States Maritime Commission and operated by American-Hawaiian Steamship Company.



DOWN THE HATCH!

Ice cream for dessert, in the middle of the ocean! The men on most of our Navy's fighting ships already have it or will be getting it soon —thanks to compact freezers refrigerated by G-E equipment.

That's the *newest* in shipboard applications of G-E Refrigeration. On hundreds of ships of every type, cargo holds, ship's stores and galleys are refrigerated by G-E equipment, designed for reliable, low-cost operation . . . and for the conservation of valuable shipboard space.

Shipbuilders planning new designs—shipowners getting ready to modernize existing bottoms—both can benefit by G.E.'s broad experience in marine refrigeration. Remember, G.E. designs and builds every major item of marine refrigeration . . . coordinates and delivers the *complete* system, with the chief components pre-assembled, *pre-tested.*

Write today for your copy of General Electric's Marine Refrigeration Booklet, describing refrigerant compressors, condensers, and receivers; cooling and heating coils; conditioned air cooling units; storage cabinets and water coolers; and necessary fittings and accessories. *General Electric Company, Air Conditioning Department, Section 55910. Bloomfield, New Jersey.*

BUY . . . and hold . . . WAR BONDS

GENERAL ELECTRIC

Marine Refrigeration



REMOVES SOOT & FIRE-SCALE

WHILE BOILERS OPERATE

CHIPPING AND SCRAPING IS UNNECESSARY when you use XZIT. Simply feed XZIT into the fire-box while the boilers operate. When thrown on the fire in a furnace it forms a gas which permeates all parts of the boiler, the uptakes, and the stack and has a chemical reaction on the soot and fire scale.

XZIT can be used to extinguish stack fires and to stop sparking. Regular use keeps boilers and stacks clean and free of soot and fire-scale.

Used by all types of merchant and naval ships, XZIT is a proved product. Write for demonstration or order a trial supply. There is an XZIT representative near you.

XZIT FIRE SCALE & SOOT ERADICATOR

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5800 S. HOOVER, LOS ANGELES, CALIF.



A. C. Morrison, chief electricol engineer, Matson Navigation Company.

A. C. Morrison, chief electric engineer, joined Matson Navigatic Company in January, 1926. He affiliated with the "Institute of Rad Engineers" and attended the Unive sity of California. He lives in Be keley, California, with his wife an two children. Enjoys spending h vacations fishing in the High Sierra

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R. P. STROUGH has arrived i the West Coast Regional Construc tion Offices, Oakland, to represer Director L. R. Sanford in all admir istrative matters while the latter, wh is in charge of all construction of th Commission throughout the country is absent from this region.

THE MOST DISCUSSED TOPI in shipping in Pacific marine circle in September was the disposal of th American President Lines as asked i bids by the U. S. Maritime Commis sion and opened on September 1(What interests or combination of in terests would be awarded the servic was eagerly awaited.

According to shipping leader never in their recollections was ther so much interest engendered in th deal of an American marine concern throughout the nation as evinced in the A.P.L. sale.

Lawrence G. Coveney has assumed his duties as vice president of Otis McAllister & Co. He was formerly export manager in New York for Pillsbury Mills, Inc.

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Shoreside Personalities

Stafford S. Harlow resumed his post as District Manager for the American-Hawaiian Steamship Company after two years as head of the WSA in Southern California region. He assumed his Los Angeles post on September 1. He has been with the American-Hawaiian 21 years.

Colonel T. H. Mitchell, vice president and general manager of RCA Communications, Inc., announced the appointment of Harry E. Austin as district manager in San Francisco, replacing **N. R. Cherrigan,** who was elevated to the position of superintendent of Central Radio Office, New York. Mr. Austin had been district commercial manager.

R. J. Miedel, Pacific Coast manager for the Hazel-Atlas Glass Co., was elected president of the Atlas Imperial Diesel Engine Company following a September 6 meeting of the Board of Directors.

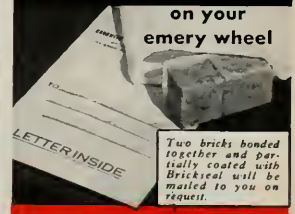
Dodwell & Co., agents for the Blue Funnel Line on the Pacific Coast and British Columbia, are expected to announce resumption of this service shortly. The concern's vessels are well known on the West Coast. Before the war they operated carriers of approximately 14,000 deadweight tons capacity, driven by twin screw, double geared turbines. They were regarded as among the finest ships for cargo handling coming into port.

Henry Kaiser named **Peer Neilsen,** former general superintendent of the huge Government steel mill at Geneva, Utah, to be director general of his mill in Fontana.

James B. Duffy, Jr., son of the retired general passenger agent of the Santa Fe, who formerly was with the Grace Line, and **Harry G. Adams,** Panama Pacific Lines, have both been promoted from Lieutenant Commander to Commander. Commander Duffy has been in sea service in the South Pacific while Commander Adams has been discharging his Navy service shore-side, handling ship matters.

BRICKSEAL
REFRACTORY COATING

Resists
ABRASION
PROTECTION against abrasion is an outstanding advantage of Brickseal. Here are two refractory bricks, one coated with Brickseal, the other uncoated. They were heated to more than 2000°, taken directly from the furnace and shoved against an emery wheel. Hot and cold, the Brickseal-treated brick resisted the abrasion – see below.
Brickseal consists of high fusion clays and metal oxides combined in oil. Furnace heat burns away the oils and vitrifies the clays and metals which penetrate deeply into the pores, cracks and joints. Brickseal prevents cracking, spalling and slagging regardless of sudden temperature changes. Brickseal is also a mortar for laying up refractory walls.
Compare the Brickseal-treated brick at the left to the untreated at the right.

TRY IT YOURSELF
on your emery wheel


Two bricks bonded together and partially coated with Brickseal will be mailed to you on request.
BRICKSEAL
REFRACTORY COATING
3800 So. Hoover St., Los Angeles, Calif.
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SHORESIDE PERSONALITIES

Shipping Man Liberated in Japan

Captain O. A. Pierson, San Francisco ship master who has been a prisoner of war in Japan since a week after Pearl Harbor, is enroute home, according to a cablegram received by his wife, Mrs. Helen D. Pierson.

Captain Pierson, a lieutenant commander in the U. S. Naval Reserve was master of the SS President Harrison enroute through the China Sea to Kamchatka to evacuate a contingent of U. S. Marines when the Japanese attacked Pearl Harbor. His ship was overhauled by Japanese naval craft and he was ordered to surrender. Instead, Captain Pierson ordered full steam ahead and rammed the ship hard aground on a rocky reef, attempting to destroy her rather than have the ship fall into the hands of the enemy.

He and his fellow officers and crew members were taken into custody and subsequently dispersed to various prison camps. The President Harrison, one of the first American ships seized as a prize of war, was reconditioned by the Japanese only to be sunk a few months later by an American submarine.

Also taken prisoner at the time was Myron (Jeff) Holzer, veteran trans-Pacific purser, who is also a resident of San Francisco. Holzer's whereabouts are presently unknown.

Another San Franciscan employed by the American President Lines in the Orient who is now enroute home after 3½ years in a Jap prison camp is P. M. Cotton, known to his friends as "Butch". Cotton was a Naval Reserve officer who was called to active duty from the Hong Kong staff with the outbreak of the war.



Walter H. Robertson

Personnel Changes at Union Metal

Walter H. Robertson has joined The Union Metal Manufacturing Company as manager of Piling Sales and Engineering. Prior to joining Union Metal, he was associated with Massey Concrete Products Company as vice president in charge of Sales and Engineering Developments.

Cove W. Sullivan, formerly manager of Piling Sales and Engineering, is now manager of the New York District, handling the sale of all of the company's regular products.

R. A. Weinland has been named Lake States district manager. For the duration of the war he was sub-contract supervisor.

Robert M. Frost, before joining Union Metal was head of Contract Unit for the U. S. Maritime Commission. At present he is assisting on expediting and priority matters.

Joseph A. Coblentz, formerly with McLean Contracting Company, Baltimore, Md., has been appointed Sales Engineer with headquarters in the Baltimore Office.

NEW YORK SHIPBUILDING CORP.

CAMDEN N. J.

BUILDERS OF STAR PERFORMERS
IN THE NAVY AND MERCHANT SERVICE



When it comes to FIXIN' SHIPS!

FOR FAST ECONOMICAL REPAIRS

USE HWP SERVICE

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Ship owners and operators will find that they save time and money by using this complete service.

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Prevent

COSTLY SHUTDOWNS

Prepare well for the opportunities of the new era ahead. Install France Full-floating Metallic Packing and seal piston rods at any pressure, on any type of reciprocating engine, pump or compressor as well as reciprocating or oscillating valve stems. Seals any vapor up to 15,000 lbs pressure, controls oil and condensation.

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- Oil Return and Stripping Rings
- Handy Reference Tables

FRANCE PACKING COMPANY
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Branch Offices in Principal Cities

Shoreside Personalities

Moore-McCormack Line offices in San Francisco are now located at 140 California Street.

H. K. Grady, formerly assistant traffic manager, was named traffic manager for Moore-McCormack Line at San Francisco, it was announced by Pacific Coast Manager K. C. Tripp.

RAPIDLY BECOMING WELL KNOWN and popular with the shipping fraternity, press and magazine personnel on the Pacific Coast is **Paul Hodges**, publicity director for the Matson Navigation Company. Mr. Hodges was named by President Frazer A. Bailey to handle all public relations matters some months ago. He has had a wide experience in his field as well as being a former newspaper executive.



William E. Hoard, Western Gear Works

Wm. E. Hoard, former assistant to the sales manager of Western Gear Works' three West Coast plants with headquarters in Seattle, has been appointed area sales manager of the San Francisco area for that firm and its associate, the Pacific Gear and Tool Works. The announcement was made by S. L. Crawshaw, manager of engineering and sales for the two companies.

Steamship employers state that the action of the War Labor Board in granting a 5-cents-an-hour increase to stevedores, retroactive to December 1, 1944, along with a week's vacation with pay, will cost the operators at least $7,000,000 and may exceed this figure.

Frank Klaveness, commander in the Navy, is now stationed in Stockholm, Sweden, as Naval Attache of the American Legation. He has been in service since 1940. Commander Klaveness was foreign freight agent in Los Angeles for Sudden & Christenson until his enlistment.

New Sales Manager—Templeton, Kenly & Co., Chicago, manufacturers of Simplex lever, screw and hydraulic jacks, announces the appointment of Philip M. McManus as Pacific Coast sales manager, with office at 50 Hawthorne Street, San Francisco 5.

Mr. McManus has been with the company for more than twenty years, much of the time in the Chicago sales department. The increased use of Simplex Jacks in the Pacific Coast territory for industrial applications of all kinds requires extensive contacts.

FITLER "LUBRICORE"

The Self-Lubricating

MARINE ROPE



U. S. Patent No. 2176422

Now that Peace has been declared, we hope the day will soon arrive when you can again purchase FITLER ROPES of prewar quality.

FITLER ROPE, backed by over a century of manufacturing experience, is noted for its strength, durability, waterrepellency and flexibility.

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Marine

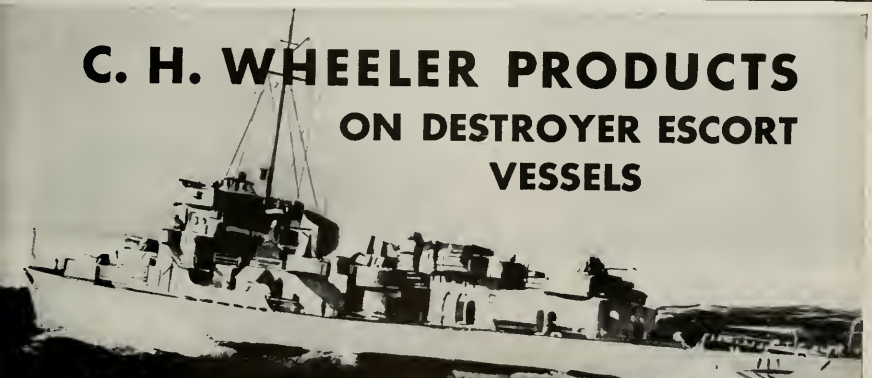
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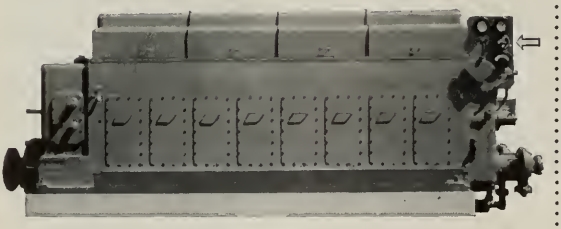
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C. H. Wheeler Products also include Boat Cranes, Airplane Cranes, Capstans, Deck Winches, Anchor Windlasses, Surface Condensers and Steam Ejector Type Air Pumps for all types of naval and merchant vessels.

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Alnor Exhaust Pyrometers

The Buckeye Machine Company, engine builders since 1908, use Alnor Exhaust Pyrometers for dependable temperature indication, in company with the majority of Diesel engine manufacturers. Checking exhaust temperatures with the Alnor Pyrometer is a dependable guide to uniform loading, efficient operation, and accurate adjustment and maintenance.

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SHORESIDE PERSONALITIES

Gerald E. Morris has joined the Los Angeles staff of the Isthmian Steamship Company, it was announced by Manager W. C. Fulton. Mr. Morris had been attached to the Southern California headquarters of the British Ministry of Shipping. He has been in the steamship business for twenty-one years, having been at one time with the Los Angeles offices of Norton, Lilly & Co., then with Panama Pacific Line and later with McCormick Steamship Company and the Argonaut Line.

Ernest J. Bradley is back in San Francisco and is expected shortly to assume his duties with the Matson Navigation Company after serving with the War Shipping Administration. Mr. Bradley tendered his resignation as United Kingdom representative after being stationed in various posts in San Francisco and Washington since the beginning of the war. He was assistant to M. J. Cropley, freight traffic manager for Matson when he joined the Government. His administration of duties won commendation from Vice Admiral Land and the rest of the Commission for a "job well done."



Ray Ellinwood of Ellinwood Industries.

Ray Ellinwood, design engineer and business executive, as of September 10 announced formation of a new firm, Ellinwood Industries, Limited, with headquarters in Los Angeles.

Until recently, Ellinwood was president of Adel Precision Products, Inc., a concern which he founded in 1937. He sold a controlling interest in Adel to Transamerica in 1943. In June of this year he resigned as president.

The new firm, which Ellinwood now heads, will produce and sell materials and machines in the agricultural implement, marine equipment, business machine and home products fields especially.

Nucleus of this new organization will include Robert S. Furst, who was assistant to the president in charge of post-war development at Adel; Robert Berns, a development division designer at Timm Aircraft; Carl Campbell, formerly director of purchases for Vultee Aircraft; and Emil Setzler, originator of a production control system, and a development and research expert.

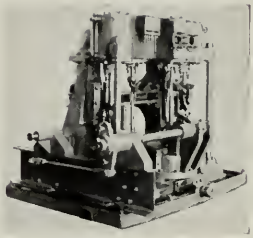
SPARE PARTS
by "STANDARD STEAM"



10 x 12½ Liberty Ship Windlass
Emerson Walker

For

LIBERTY SHIP EQUIPMENT



8"x8" Wilson-Pirrie Steering Engine

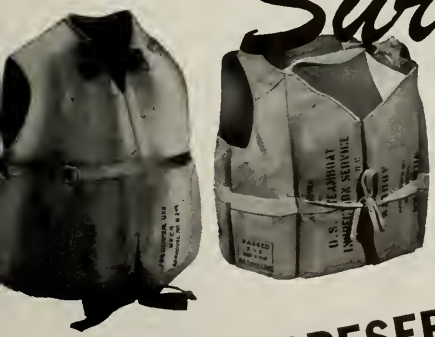
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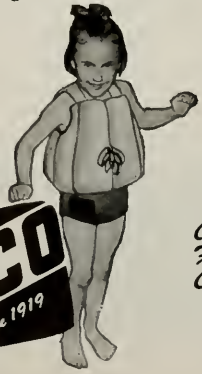
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Ralph P. Walker

RODPAK APPOINTS WALKER —Rodpak Manufacturing Company has announced its appointment of Ralph P. Walker as general sales manager.

Mr. Walker has been with General Petroleum Corporation for the last twelve years. He has been engaged in refinery engineering, including the designing and constructing of "cracking" and reforming units. He has been sales manager for Paramount Lubricants in Salt Lake.

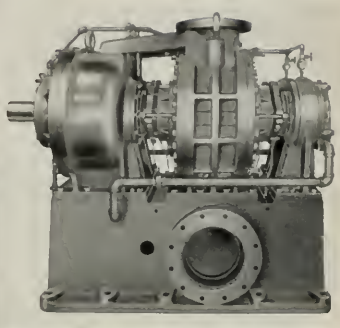
A. R. LINTNER, on leave as vice president and general manager of American Mail Line, is now located in London as representative for the WSA on the United Maritime Authority body.

PAUL E. KOHLHAAS HAS BEEN APPOINTED to fill the newly created position of vice president in charge of engineering of Columbia Steel Company, it was announced by William A. Ross, president.

Paul F. Kohlhaas, newly appointed vice president in Charge of Engineering of Columbia Steel Company, a U. S. Steel Corporation subsidiary.



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Shoreside Personalities

BENDIX CHANGE: As of November 27, the Southern California marine account of the Bendix Aviation Corporation, Marine Division, will be assumed by the Bendix Aviation Corporation, Pacific Division, at Van Nuys. Until that date the account remains with Paul W. Hiller of Wilmington, who has handled it so satisfactorily for many years.

The Esso Tanker Men's Association defeated the CIO National Maritime Union by 658 votes to 327 in the Labor Board election conducted among the unlicensed personnel of the American flag tankers of Standard Oil Co., it was reported from New York.

WORTHINGTON MAN AT PROPELLER BLOWOUT



John P. McArthur, district manager of San Francisco office of Worthington Pump Co., watches the post-prandial festivities at Propeller Club Golf tourney at Lakeside at San Francisco.



Miss Ethel Johnson, president of the California Federation of Business and Professional Women's Clubs, presents the club's safety plaque to Edward Lange, safety engineer of the Bethlehem-Alameda Shipyard, Inc., on September 13 for the safety record set by this yard during 1944. This yard was selected by the Maritime Commission because it held the lowest accident frequency rate during the past year in northern California.

REMEMBER!

PROPELLER CLUB MEMBERS TO ATTEND NEW YORK AMERICAN MERCHANT MARINE CONFERENCE

Along with the National Convention of the Propeller Club of the United States on October 17, 18, and 19 in New York City

Theme: "Post-War Aspects of the American Marine Industry"

Propeller Club News

IN SAN FRANCISCO: Major General Homer M. Groninger, USA, Commanding General of San Francisco Port of Embarkation, was guest speaker at the opening meeting of the fall sessions of the Propeller Club, Port of San Francisco, on September 19.

Since that meeting, members of the Propeller Club and readers will be interested to hear of the honor bestowed on General Groninger and his second in command, Major General William M. Goodman. On October 2, General Brehon Somervell, Commanding General of the Army Service Forces, awarded the generals the Distinguished Service Medal and the presentation was made before a massed formation of more than 500 officers at Fort Mason.

General Groninger was cited for "quickly expediting the facilities of this port to meet requirements of supplying men and materiel for overseas combat," and the citation further stated that he performed "exceptionally meritorious service to the Government in a position of great responsibility from July, 1942, to July, 1945." This brings to mind the excellent job he performed at the Port of New York during the European theater operations.

IN LOS ANGELES: Victory Fleet Day was the theme of the Los Angeles-Long Beach Port of the Propeller Club when, on September 27, Admiral William H. Standley, USN (Ret.), spoke to the club.

Admiral Standley is a graduate of the Naval Academy, Class of '95, and served in the Spanish American War, was Naval Captain during World War I; later he was Chief of Naval Operations during 1937-1938. After retiring he was recalled to active duty in March, 1941, and appointed Ambassador to Moscow in February of 1942.

He is the man, according to the Encyclopedia Britannica, that criticized U. S. S. R. for failing to publicize the Lend-Lease aid from the United States. As a result Soviet newspapers increased their information regarding war materials that we were supplying.

Mariners See "Shore Convoy"

Through the courtesy of the Standard Oil Company, the Mariner's Club of California were shown a sensational Merchant Marine movie called "Shore Convoy" during the Club's October meeting. The motion picture unreeled the contribution of the Merchant Marine through the early days of the war, the torpedoing on the dangerous Murmansk run, the job yet to be done in taking supplies to foreign ports, and the job of bringing home our fighting veterans.



U.S.S. HUTCHINS — D.D. 476

Official U S. Navy photograph

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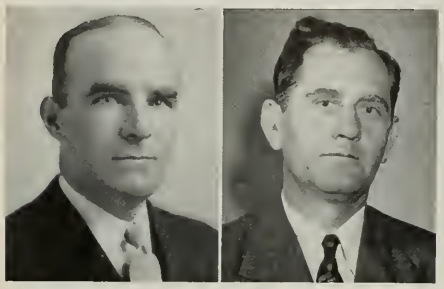
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Left to right: H. J. McPeak, and Jack Whipple, of Enterprise Engine & Foundry Co.

ENTERPRISE ENGINE & FOUNDRY COMPANY'S APPOINTMENTS: The appointment of Jack Whipple as sales engineer in charge of fish plant designing, engineering and erection has been announced, together with the appointment of H. J. McPeak as sales engineer in charge of Process Machinery Division sales. The Process Machinery Division of Enterprise is designing, equipping and building fish reduction plants throughout the world, as well as a complete line of mills, presses, cookers and dryers.

ANOTHER SECRET OF WAR was revealed with an announcement that development of a "plastic armor" made of ordinary asphalt and gravel, road building materials, which protected British merchant ships and landing craft throughout the war had afforded protection against machine gun bullets and shell or bomb fragments, equal to that of light steel. The composition was bolted in slabs to the walls of cabins, machine gun posts, wheel houses, radio rooms and deck houses of the merchant ships.

WILMINGTON TRANSPORTATION COMPANY

General Agent: War Shipping Administration

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SHORTLY AFTER THE RETURN of Harry S. Scott, president, and Ray Winquist, vice president, General Steamship Corporation, from a tour of Europe where they conferred with principals of lines the General represents, it was announced the concern has been appointed Mississippi Shipping Company agents on the West Coast.

The Gulf concern has ordered three 17,000-ton luxury liners to operate from New Orleans to ports in Brazil, Uruguay and Argentina.

HARRY HORNUNG, former freight traffic traffic manager in San Francisco with a well-known steamship line and regarded as one of the top-ranking men in the transpacific service, is back after three years in the South Pacific with the rank of Lieutenant Colonel in the Transportation Corps. Colonel Hornung, who is now attached to the local Transport Headquarters, wears the bronze star, campaign ribbons for the battles of New Guinea, Leyte, Luzon and the Manila invasion. He expects to be discharged this month and plans to become affiliated again with one of the steamship services.

UNDER INTERESTING READING IN TRADE JOURNALS: The August issue of Sperryscope, Volume Ten, Number Eight, put out by the Sperry Corporation, has as its feature story the history of the United States Military Academy. The article on West Point's Sixth War is told by Major General Francis B. Wilby, U.S.A., Superintendent of the Academy, and is the chronicle of this great institution. Another outstanding feature of the August issue is the cover which shows in natural color the scene of Battle Monument, near Trophy Point at West Point, N. Y.



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(Continued from Page 636)

the flame directly on the point. Joff developed this tool while working on the problem of speeding repair of Army thermos food container covers, which have a propensity for coming apart.

One of the most useful time and labor saving items to which the Quartermaster has fallen heir as the result of Joff's inventive gift, however, is an electrical machine with a specially designed wire brush attachment that cleans the inside of the kidney-shaped canteen cups carried by soldiers. The time previously required to remove the crust that forms in the cup was about a half hour. Now the job can be done in a little more than a minute, and the use of acid, sometimes unobtainable in the field, has been eliminated.

Other Joff inventions are a tool to take apart in one movement the unwieldly hinge on a tent shelter half pole; a machine for removing dents in steel helmets with one blow of a pestle curved to follow the line of the helmet; a press to replace cork gaskets in canteen screw-tops, and a mechanical rotary drum for cleaning GI tableware.

All of these machines have been constructed from salvage material, at no cost to the government.

Joff, who was born in Stalingrad, U.S.S.R., at the turn of the century, when the city was known as St. Petersburg, came to San Francisco directly from Russia in 1921, and immediately enrolled at the University of California in Berkeley to study business management and production. His objective at that time was to find short cuts to mass production of his art creations.

After two years of study he opened a studio in San Francisco, and in the succeeding years became a member of the Studio Guild of New York, the American Federation of Arts, the Chicago No-Jury Society of Artists, and other art organizations. He still holds these memberships, but for the duration is submitting no exhibits.

He is now an instructor in the Civilian Training Section at the Port, where certain business machines wince at his approach. He has learned the inner workings of adding machines, calculators, and mimeographs, and there is no telling when they will inspire him with some revolutionary ideas. Needless to say, he has learned these things from observation.

* * *

Hot Off the Press

Meehanite in Industry, Bulletin No. 22, released by Meehanite Research Institute, New Rochelle, N.Y., is a 127-page booklet containing a collection of articles about Meehanite castings which have appeared in various trade publications.

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NECROLOGY

The passing of William C. Shaw on September 29, at the age of 68, came as a distinct shock to his many friends in the shipbuilding and marine engineering industry on the Pacific Coast.

He joined the staff at Bethlehem San Francisco yard in January, 1921, and for many years he was chief engineering draftsman there; more recently he had charge of all design work in the marine engine repair department.

His early marine engineering education had been acquired on the Clyde, Scotland, where he left to settle in Vancouver, B. C., shortly before the outbreak of World War I.

Since that time he has been engaged in the design departments on engine and ship repairs, and new construction, acting as chief engineer at the Smith and Watson Iron Works, the Columbia River Shipbuilding Corp. and the North West Bridge and Iron Co., all of Portland.

The deep interest he showed in the training of young men in the marine engineering field is especially praiseworthy.

Captain Harold A. Cunningham, manager of the Port of New York Office of the Standard Oil Company (N. J.) and former Commodore of the United States Lines Fleet, died at New York Hospital on Saturday, September 1, following an illness of several weeks' duration.

Captain Cunningham was born at Sag Harbor, Long Island, on February 29, 1884. He started following the sea as a boy of fourteen and became pilot of the steamer Shinnecock, operating between Sag Harbor and New York City. He left that vessel in 1906 and went to the Morgan Line, becoming Third Officer of the steamship Momus and stayed with the ship until he acquired his Master's license.

In 1917, Captain Cunningham was enrolled in the United States Navy as a Senior Lieutenant. He was assigned to the USS Leviathan as Senior Navigator and later attained the rank of Lieutenant Commander.

Late in 1920, Captain Cunningham joined the United States Mail Line as Master of the steamship Panhandle State and when that line became the United States Lines he was transferred to the bridge of the George Washington. In 1928, he was appointed to the liner Leviathan and became Commodore of the United States Lines Fleet.

Captain Cunningham continued in command of the Leviathan until 1931, when he left the United States Lines to become associated with the Marine Department of the Standard Oil Company of New Jersey as Port Captain. At the time of his death he was Manager of that company's Port of New York Office at 115 Broadway. He was also President of the USS Leviathan Association.

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McCuan With Aero-Coupling

H. M. Davis, president Aero-Coupling Corporation, Burbank, Calif., manufacturers of flexible hose assemblies and fittings, annnounces the appointment of Chas. E. McCuan as manager of Engineering Sales. McCuan is well known in the field of applied hydraulics through his past work with Aeroquip Corp., Jackson, Mich.; Air Associates, Los Angeles, and Vultee Aircraft, Downey Division. At Aero-Coupling he will coordinate and develop the applications of their flexible hydraulic lines and fittings in automotive, industrial, marine, refrigeration and aircraft requirements as well as for products and maintenance.

Vice Pres.—Sales U. S. Steel

Benjamin F. Fairless, President, on October 2nd, announced the election of David F. Austin as vice president — Sales, United States Steel Corporation of Delaware. Mr. Austin has been Acting Vice President since June 20, 1945, during which time he continued as Vice President in Charge of Sales, Carnegie-Illinois Steel Corporation.

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Bethlehem's Day At Mariner's Club

At the first meeting of the fall season the Mariner's Club of California had a program sponsored by Bethlehem Steel Company with H. P. "Bud" Stewart, chairman of the day.

The feature of the program on September 5 was a new motion picture called "Shipways," the story of ships past and present, typifying the drama of America's shipbuilding effort. This film presents flashbacks to clipper days, to World War I, to pre-war era, and then to modern war times; how great yards grew up almost overnight, how to build a ship from keel-laying to trial run; how to train thousands of workers, how America's shipbuilding program has been affected in the ever-changing phases of the war; battle action scenes, and how a ship is commissioned. Naval ships as well as cargo vessels are shown through this swift-paced 40-minute action film.

Thomas Short, president of the club, had as Bethlehem guests at the head table:

W. M. Laughton, general manager of Pacific Coast District, Ship division of Bethlehem; E. C. Rechtin, manager of San Pedro Yard; T. C. Ingersoll, manager of San Francisco and Alameda Yards; R. A. Forster, general superintendent, San Francisco Yard; Julian Arntz, assistant to manager of San Francisco Yard; J. K. Peters, J. L. Pringle, A. R. Beckman, J. T. Greany, of Marine Sales Department; A. C. Teare, Steel Sales Department; Milo S. Farwell, Steel Sales Engineer; and M. D. Salisbury, Publicity Director, all of Bethlehem Steel Co.

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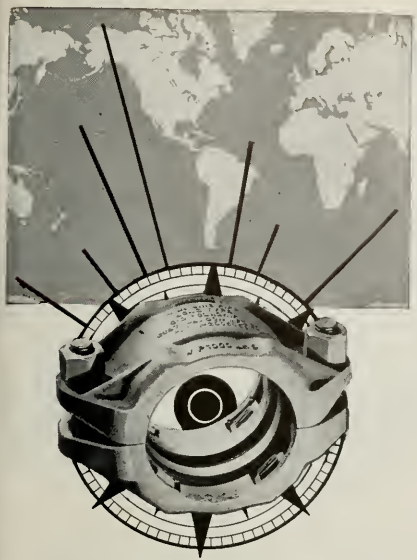
The Construction Machinery Company of Waterloo, Iowa, has appointed the Standard Machinery Company as their exclusive distributors on all of their products in Northern California. Construction Machinery Company products include: self priming and diaphragm pumps, well point pumps, contractors hoists, lighting plants, concrete guns, concrete mixers, power saws, radial saws, hydraulic cranes, bin batchers, plaster and mortar mixers, buckets, carts and wheelbarrows.

Lintner Returns to Seattle S. S. Post

Development of unforeseen changes has caused A. R. Lintner, who left Seattle recently for London to represent the United States on the United Maritime Authority, to forego his trip abroad and to resume his duties in Seattle as vice president and general manager of the American Mail Line.

Lintner was granted a leave of absence by the American Mail Line so he would be available to represent the United States on the United Maritime Authority in London, at the request of Admiral E. S. Land, administrator of the War Shipping Administration. It was announced recently that the U. M. A. would be dissolved by January 1. Lintner was to represent the steamship industry of the United States at the London conference.

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Rolagrip Pipe Couplings are credited with the saving of millions of man hours in ship building due to their speedy installation.

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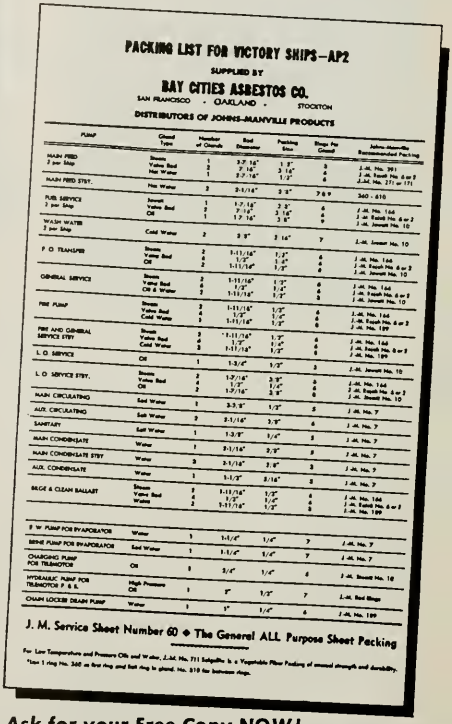
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PUMP	Gland Type	Number of Glands	Rod Diameter	Packing Size	Rings Per Gland	Johns-Manville Recommended Packing
MAIN FEED 2 per Ship	Steam, Valve Rod, Hot Water	1 1 1	3-7/16" 3"-16" 2-7-16"	1-7/8" 3-1/4" 1-1/2"	5 6 6	J.-M. No. 391 J.-M. Spark No. 6 or 7 J.-M. No. 371 or 171
MAIN FEED STBY.	Hot Water	2	2-1/16"	2-3/4"	7&9	360 - 610
FUEL SERVICE 1 per Ship	Steam, Valve Rod, Oil	1 1 1	1-7-16" 2-1/2" 1-7-16"	2-3/4" 2-1/4" 2-3/4"	6 6 9	J.-M. No. 166 J.-M. Spark No. 6 or 7 J.-M. Jacket No. 10
WASH WATER 2 per Ship	Cold Water	2	2-3/4"	2-1/4"	7	J.-M. Jacket No. 10
F. O. TRANSFER	Steam, Valve Rod, Oil	2 6 2	1-11/16" 1-3/4" 1-11/16"	1-1/4" 1-1/4" 1-1/4"	6 6 6	J.-M. No. 166 J.-M. Spark No. 6 or 7 J.-M. Jacket No. 10
GENERAL SERVICE	Steam, Valve Rod, Oil & Water	2 6 2	1-11/16" 1-1/2" 1-11/16"	1-1/4" 1-1/4" 1-1/4"	6 6 6	J.-M. No. 166 J.-M. Spark No. 6 or 7 J.-M. Jacket No. 10
FIRE PUMP	Steam, Valve Rod, Cold Water	2 6 2	1-11/16" 1-1/2" 1-11/16"	1-1/4" 1-1/4" 1-1/4"	6 6 6	J.-M. No. 166 J.-M. Spark No. 6 or 7 J.-M. No. 199
FIRE AND GENERAL SERVICE STBY.	Steam, Valve Rod, Cold Water	2 6 2	1-11/16" 1-1/2" 1-11/16"	1-1/4" 1-1/4" 1-1/4"	6 6 6	J.-M. No. 166 J.-M. Spark No. 6 or 7 J.-M. No. 199
L. O. SERVICE	Oil	1	1-3/4"	1-1/2"	3	J.-M. Jacket No. 10
L. O. SERVICE STBY.	Steam, Valve Rod, Oil	2 4 2	1-7/16" 1-1/2" 1-7/16"	2-3/4" 1-1/4" 2-3/4"	6 6 6	J.-M. No. 166 J.-M. Spark No. 6 or 7 J.-M. Jacket No. 10
MAIN CIRCULATING	Salt Water	1	3-3-8"	1-1/2"	3	J.-M. No. 7
AUX. CIRCULATING	Salt Water	2	2-1/16"	2-3/4"	6	J.-M. No. 7
SANITARY	Salt Water	1	1-3/8"	1/4"	3	J.-M. No. 7
MAIN CONDENSATE	Water	1	2-1/16"	2-3/4"	3	J.-M. No. 7
MAIN CONDENSATE STBY	Water	1	2-1/16"	2-3/4"	3	J.-M. No. 7
AUX. CONDENSATE	Water	3	2-1/16"	2-3/4"	3	J.-M. No. 7
BILGE & CLEAN BALLAST	Steam, Valve Rod, Water	1 2 2	1-1/2" 1-11/16" 1-11/16"	2-1/16" 1-1/2" 1-1/2"	3 6 6	J.-M. No. 7 J.-M. No. 166 J.-M. Spark No. 6 or 7 J.-M. No. 199
F. W. PUMP FOR EVAPORATOR	Water	1	1-1/4"	1/4"	7	J.-M. No. 7
BRINE PUMP FOR EVAPORATOR	Salt Water	1	1-1/4"	1/4"	7	J.-M. No. 7
CHARGING PUMP FOR TRIMOTOR	Oil	1	2"	1/4"	7	J.-M. No. 7
HYDRAULIC PUMP FOR TRIMOTOR P & S.	High Pressure Oil	1	2"	1/4"	6	J.-M. Braid No. 18
CHAIN LOCKER DRAIN PUMP	Water	1	1"	1/2"	7	J.-M. Red Rings
		1	1"	1/4"	6	J.-M. No. 199

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Hot off the Press

"Rubber Gloves" is a new catalog section on its all-synthetic industrial rubber gloves published by The B. F. Goodrich Company, Akron, Ohio. Feature is a page of illustrated instructions on how to get the most economical service from acid and industrial rubber gloves.

* * *

The Sharples Corporation, Philadelphia, Pa., announces three bulletins now available.

Bulletin No. 1234-B sets forth equipment especially designed for the centrifugal clarification of lacquer, paints and enamels.

Bulletin No. 1226-C is a technical presentation of centrifugal force by Arthur Ayres, chief engineer of the corporation. It covers the theoretical discussion of centrifugal force; the functioning of the centrifuge bowls; a discussion of centrifuge design; and some notes on installation and operation.

Bulletin No. 1230-B, "How the Bowls of Sharples Super-Centrifuge Function," is in color and graphically shows centrifugal force at work effecting a separation of heavy and solid liquids.

It is thought that these books will contribute much to the dissemination of the data on the application of the phenomena of centrifugal force.

* * *

L. J. Wing Mfg. Co. has published two new bulletins. Bulletin SW-1 covers forced draft blowers, both turbine and motor driven, and auxiliary turbines; information includes photographs of installations, capacity curves, dimension tables and operating data.

Bulletin F-9 covers ventilating and duct type fans. It describes the new Wingfoil fan wheel, the Wingfoil straight line duct fan, and the Wingfoil elbow type duct fan.

* * *

"Annual Report" by Consolidated Steel Corporation, Ltd., is a very unusual business publication. It is a great deal more than a financial analysis. It is, rather, a broad review of America's wartime ship production and the corporation's part in it. There are sections describing each of Consolidated's operations, complete with beautiful photographs, in as much detail as censorship regulations permitted.

* * *

General Motors Corporation, Cleveland Diesel Engine Division, has issued a 100-page booklet containing a representative showing, through photographs, of the important naval and commercial craft powered by diesel. In addition to the photographs there are design pages showing the placement of the engines in the hulls by both profile drawings and general arrangement plans.

* * *

"Industrial Electronics" is a 96-page booklet published by General

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Electric. It covers practical applications of electronics in industry. The book contains excellent photographs, as well as explanations of methods of inspection, testing, counting and measurement.

* * *

Bulletin No. 230-A covers the Bailey Pyrotron Electronic Resistance Thermometer, and is published by Bailey Meter Company, Cleveland, Ohio. This 12-page booklet describes the thermometer's outstanding features and explains their special value for marine, mobile and other classes of severe service, since no galvanometers or millivoltmeters are used and no parts move in the measuring circuit except during the temperature changes.

* * *

Airco "45" and "45M" high speed machine cutting tips for faster cutting is a bulletin released by Air Reduction, New York, N. Y. It explains the principles of these high speed tips for faster machine cutting, the manner in which they reduce finishing requirements, and the narrow kerf produced.

Bayard & Co. of Philadelphia, Pa., have published a bulletin, Manual No. A-100, which covers remote mechanical control elements (light series). The brochure contains detailed application and design features as well as excellent blueprints and diagrams.

* * *

Caterpillar Tractor Co. presents its annual report for 1944 in a 32-page illustrated booklet. The company's part in war production is covered in detail, along with some excellent illustrations depicting the job that Caterpillar has done in battle areas. The company's financial statement is incorporated in the book, as are graphs illustrating its industrial relations.

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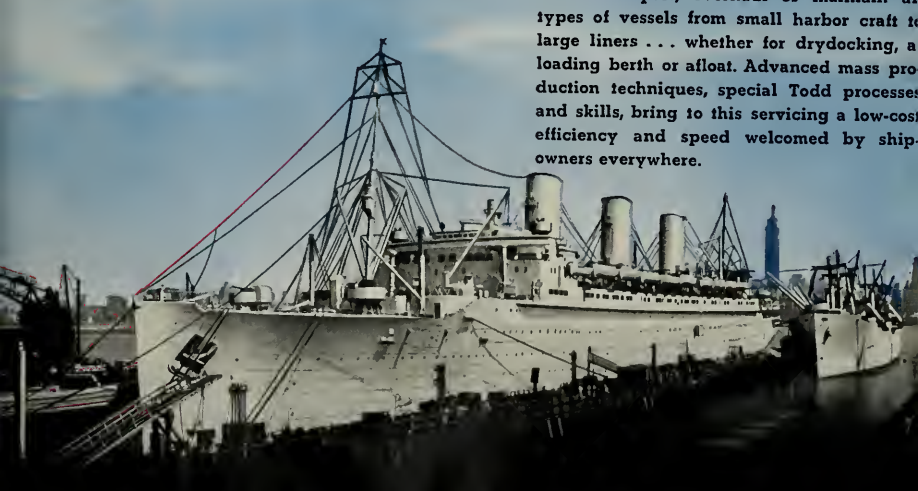
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NOVEMBER, 1945

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year, $1.50; two years,
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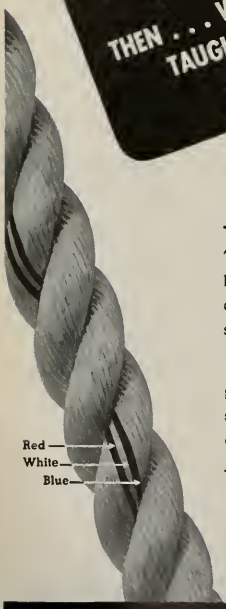
PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
LOS ANGELES OFFICE . . . . . 816 West 5th Street, Zone 13. Telephone MIchigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.



WE STABILIZED NYLON GLIDER TOW ROPE

. . . kept it from kinking and snarling

THEN . . . WE TAUGHT IT TO TALK!

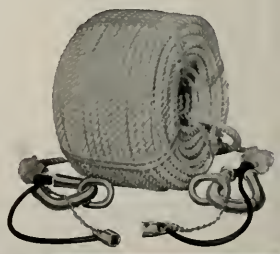


In the early days of the war, Nylon tow rope was shortlived because it kinked and whipped. The success of great invasions by the Airborne infantry depended upon stabilizing the tow rope.

Columbian Laboratories attacked the problem . . . stabilized the rope . . . made it trail straight behind the plane. Our patent No. 2,343,892.

THEN WE GAVE IT VOICE! Plane to glider communication was essential. The old method was to loop the telephone cable along the tow rope. After Columbian Laboratories studied that one, we produced a tow rope with built-in communication wires (Patent Pending), with jacks at the ends to plug in the service . . . jacks that released smoothly when the glider cut loose!

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Pacific MARINE REVIEW

U. M. E. B. Relaxes

The third session of the United Maritime Executive Board was held in Washington from October 4 to 11.

During this meeting the Board members decided to maintain United Maritime Authority for a period of six months more, beginning on September 2, 1945. This tentatively sets March 2, 1946, as the date for terminating the U.M.A. agreement.

In an attempt to return to normal, on an orderly basis, the commercial tonnage operations, the executive committee decided to simplify the operation of U.M.A. control of Allied shipping, and for this purpose authorized six steps:

(1) The establishment of certain world trading areas as "commercial areas." Tonnage assigned to these areas by U.M.A. would operate free of U.M.A. control. Each contracting government would have permission to nominate dry cargo vessels of its own flag to carry out the responsibilities assigned to it by U.M.E.B., effective at future date or dates to be agreed.

(2) All tanker operations to be released from U.M.A. control effective October 31, 1945, subject to the requirements of certain governments for the balance of 1945.

(3) Relaxation of restrictions covering transfers of vessels to the flags of nations not participating in U.M.A., subject to the review of U.M.E.B. in each case.

(4) Relaxation of restrictions covering time charter of vessels to private individuals or firms within the contracting nations. These relaxations permit continuance of certain long-time charters, and charters with respect to any vessels operating in "commercial trades."

At this meeting it was agreed that the next meeting would be held at London early in January, 1946, to determine if March 2, 1946, is to be the final termination date.

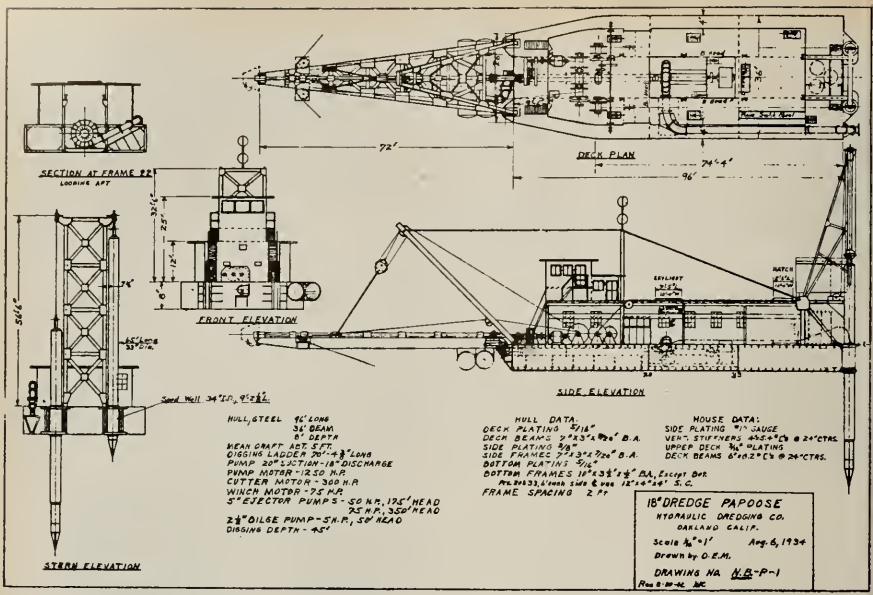
During a general discussion of the world shipping situation, Admiral Emory S. Land, chairman, stated that it was the policy of the W.S.A. and the U.S.M.C. to lay up in reserve something on the order of 2000 commercial ships that would be untouchable except by statute.

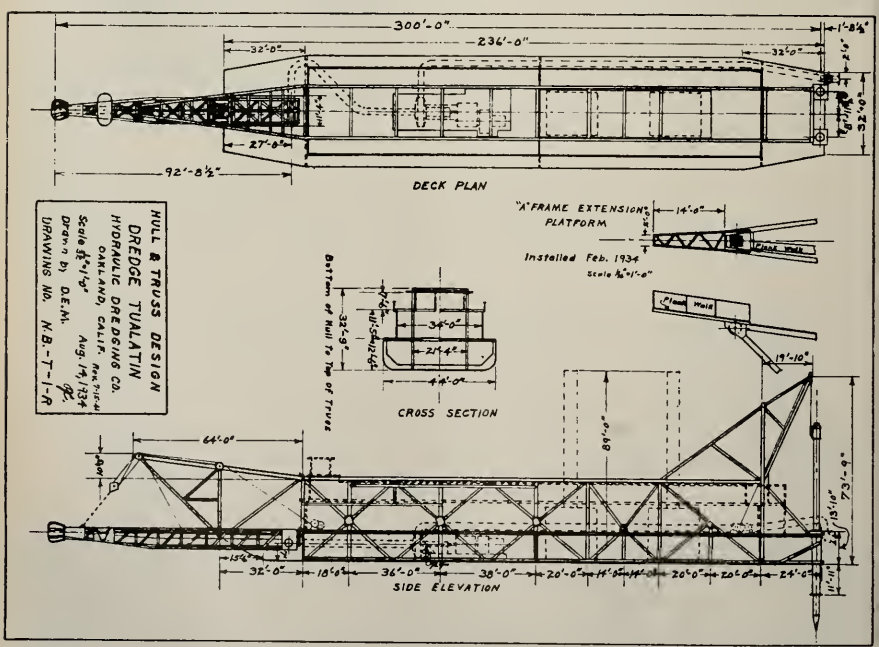
These actions are all steps in the right direction but each of them seems to be a rather hesitant step, surrounded by ifs and buts to such an extent that it scarcely makes any easier the mental processes of a ship-operating executive trying to figure the future of his business.

Of course, this must of necessity be true in any changes of an agreement to which many countries and many divergent interests are contractors.

Also, of course, these qualifying phrases are wise precautions in a post-war world that has not yet settled into the ways of peaceful commerce but is still in a state of violent unrest, with large displaced civilian populations to be repatriated and large armies to be returned to their homelands, in many cases over long water routes.

Admiral Land has a tremendous responsibility. He is: managing head of the largest shipbuilding concern in the world; operating head of the largest ship-owning concern that ever operated ships; and chairman of the board managing the operation of the merchant marine fleet of the world. Has any other one man in history ever had quite so much maritime responsibility? And yet (more power to his fighting American heart) he is doing a magnificent job in all three of these great tasks.


SECTION AT FRAME 22
LOOKING AFT
DECK PLAN
72'
74'-4"
96'
FRONT ELEVATION
SIDE ELEVATION
STERN ELEVATION
Sand Well 34"I.D., 9'-2½"
HULL, STEEL 96' LONG
36' BEAM
8' DEPTH
MEAN DRAFT 6ft. 5 FT.
DIGGING LADDER 70'-4½" LONG
PUMP 20" SUCTION-18" DISCHARGE
PUMP MOTOR-125 H.P.
CUTTER MOTOR-300 H.P.
WINCH MOTOR-75 H.P.
5" EJECTOR PUMPS-50 H.P., 175' HEAD
25 H.P., 350' HEAD
2½" BILGE PUMP-5 H.P., 50' HEAD
DIGGING DEPTH-45'
HULL DATA:
DECK PLATING 5/16"
DECK BEAMS 7"x8.3"x7/16" B.A.
SIDE PLATING 3/8"
SIDE FRAMES 7"x8.3"x7/16" B.A.
BOTTOM PLATING 5/16"
BOTTOM FRAMES 10"x3½"x½" BA., Except Bet.
Frs. 8x8.3, 4 Frms. Side & Bot. 12"x10"x½" S.C.
FRAME SPACING 2 Ft
HOUSE DATA:
SIDE PLATING ¼" GAUGE
VERT. STIFFNERS 4"x3.4"x⅜ @ 24" CTRS.
UPPER DECK ⅜" PLATING
DECK BEAMS 6"x8.2"x⅜ @ 24" CTRS.
18" DREDGE PAPOOSE
HYDRAULIC DREDGING CO.
OAKLAND CALIF.
Scale ⅛"=1' Aug. 6, 1934
Drawn by O.E.M.
DRAWING NO. H.D.-P-1
Rev 8-10-34 MC


300'-0"
236'-0"
32'-0"
32'-0"
27'-6"
92'-8½"
DECK PLAN
"A" FRAME EXTENSION PLATFORM
14'-0"
Installed Feb. 1934
Scale ⅛"=1'-0"
Bottom of Hull To Top of Truss
32'-0"
34'-0"
27'-4"
4'-4"-0"
CROSS SECTION
64'-0"
19'-10"
32'-0"
18'-6"
36'-0"
38'-0"
20'-0"
14'-0"
20'-0"
20'-0"
24'-0"
SIDE ELEVATION
HULL & TRUSS DESIGN
DREDGE TUALATIN
HYDRAULIC DREDGING CO.
OAKLAND, CALIF.
Scale ⅛"=1'-0" Aug. 14, 1934
Drawn by O.E.M.
DRAWING NO. H.D.-T-1-R

Analysis of Hydraulic Dredge Design

By Paul J. Cushing and Paul M. Enright

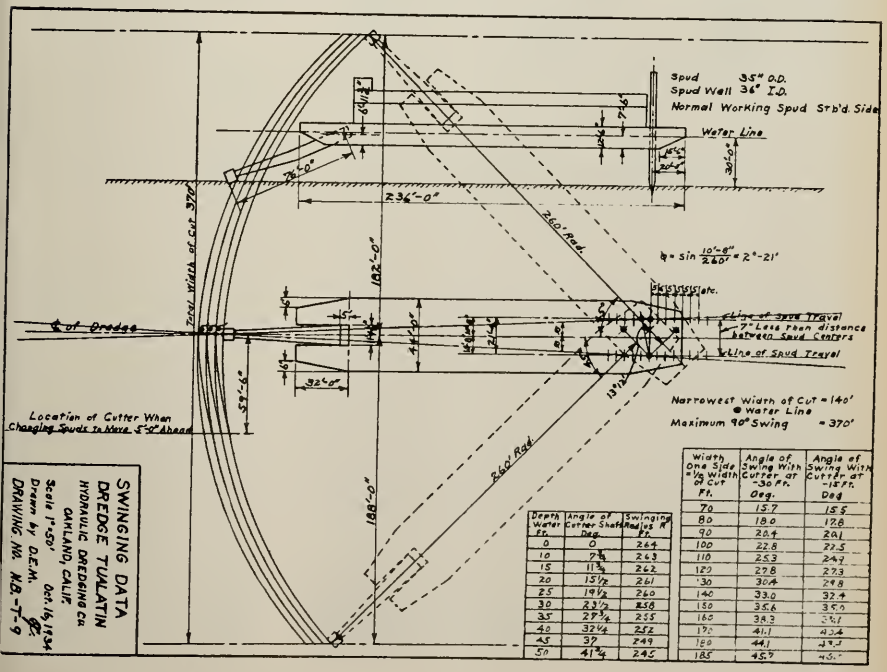
Compiled by the authors, this article is an abstract of a very comprehensive, almost encyclopedic paper describing and analyzing the factors involved in the design and operation of the Hydraulic Dredge.

This paper was presented at a meeting of the Northern California Section of the Society of Naval Architects and Marine Engineers, San Francisco, on September 26, 1945.

Both of the authors have had long experience in the theory and practice of dredging, and the complete paper forms a very valuable addition to the literature of that art.

Mr. Cushing is president and Mr. Enright chief engineer of Hydraulic Dredging Company, Ltd., Oakland, California.

THE HORSEPOWER requirements of the main pump are functions of the length of line, lift, and type of material to be dredged. The velocity necessary to keep the material moving varies with the type of material. In silt of soft mud, 14 feet per second can be a safe velocity, while 20 feet per second might be required in heavy coral rock. In general, the most efficient velocity in easily pumped material is that velocity which just carries away the ma-



Depth Water Ft.	Angle of Corner Shaft Deg.	Swinging Radius R Ft.
0	0	264
10	7 3/4	263
15	11 3/4	262
20	15 1/2	261
25	19 1/2	260
30	23 1/2	258
35	27 3/4	255
40	32 1/4	252
45	37	249
50	41 3/4	245

Width One Side = 1/2 Width of Cut Ft.	Angle of Swing With Cutter at -30 Ft. Deg.	Angle of Swing With Cutter at -15 Ft. Deg
70	15.7	15.5
80	18.0	17.8
90	20.4	20.1
100	22.8	22.5
110	25.3	24.7
120	27.8	27.3
130	30.4	29.8
140	33.0	32.4
150	35.6	35.0
160	38.3	37.7
170	41.1	40.4
180	44.1	43.3
185	45.7	45.1

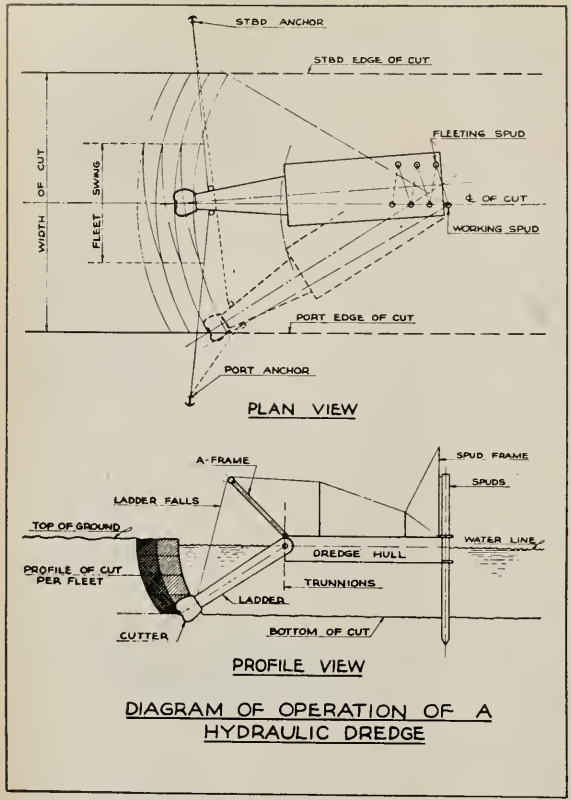


DIAGRAM OF OPERATION OF A HYDRAULIC DREDGE

terial delivered to the pump. In this type of material the limiting factor in the output is usually the digging vacuum available. As the velocity in the discharge line is lowered, less vacuum is wasted in friction, which leaves a higher percentage of the total vacuum available for transportation of material to the pump.

In material that is hard to pump, the problem is to carry it away. High velocities are necessary as a factor of safety against plugged lines, but these high velocities, in turn, reduce the available digging vacuum.

From the above, it may be seen that there are both upper and lower critical velocities for each type of material. Between these limits, the carrying capacity of the pipe stream remains sensibly constant, but above and below, it drops off sharply.

The chart on page 641 shows graphically the effect upon output of variations in pump horsepower per foot of line for light, medium, and heavy materials. Keeping in mind that both pipe line length and character of material often change radically during brief operating periods, a study of the chart should show the necessity for variable speed on the main pump.

From general experience and the previous analysis, it would seem that: (a) The minimum economic requirement is a 20% speed reduction, which would give a power variation of 51% on the centrifugal pump. (b) Speed reductions beyond 20% are economically justifiable only if obtained without excessive cost.

On a self-powered dredge, speed control is inherent in the unit. Speed control on electric dredges, where ac slip ring wound rotor induction motors are generally used, is achieved by varying the resistance in the secondary or by introducing a counter voltage in the secondary.

Varying the resistance in the secondary is cheapest from the standpoint of first cost, and it is well adapted to dredge use. While the slip energy is dissipated in heat, the over-all cost per cubic yard can be reduced as much as from ten to twenty per cent in mixed digging due to the increased output made possible by the speed control.

By introduction of a counter voltage in the secondary we are able to salvage the slip energy and correct power factor. This system costs 5 or 6 times as much as would a liquid rheostat. Choice between the two is a problem in economics—consideration being given to the difference in power cost and cost of operation.

Winding Gear

All operations pertaining to the movements of the dredge are handled by the winding gear. It is used to raise and lower the spuds and ladder, and to swing the cutter from side to side across the cut. Often it is used to handle the mooring wires used when the dredge cannot be operated with spuds.

It should be possible to raise the ladder 40 feet in the time it takes to swing the dredge from the side to the center of cut. On the digging swing, when the cutter is undercutting the material, the winding gear must be able to heave the cutter into the bank and develop the full rated load of the cutter drive. On the walking swing, when the cutter is overcutting the material, the cutter will tend to run away instead of dig. Under this condition the brake on the opposite swing wire must be strong enough to hold the cutter to a normal rate of swing against the full load torque of the cutter drive.

Often the material is so hard to dig that the walking swing cannot be safely controlled and there is danger of wrecking the equipment. In this case the cutter is worked only on the digging swing and then coasts back across the cut. Since the coast in-

volves lost time, it should be made at as high a rate of speed as possible.

The relative speed and line pull requirements for the different operations are:

(1) Spuds—High pull, low speed.
(2) Ladder—Moderate pull, high speed.
(3) Walking Swing — Low pull, high speed.
(4) Digging Swing — High pull, moderate speed.

Cutters

The cutters now in general use fall into two general classifications, basket types and straight arm types. The basket type is also known as the Ellicott cutter. This cutter consists of a hub, back wearing ring and several spiral-shaped knives or blades integral with the hub and wearing ring. The cutter is pear-shaped in appearance with the blades turning backward through 180 degrees at the nose to join the hub. The straight-arm type cutter consists of a hub, sometimes a back wearing ring, and several spiral-shaped blades. The blades are attached to the hub, and wearing ring, if any, by bolts.

The special blades in either type of cutter must conform to several requirements. The cutting action must be smooth. This is obtained by having the wrap of the blades overlap each other. The cutting edge must wear continuously to a sharp edge until worn out and the blade must clear itself from rubbing against the uncut bank. This required digging angle is a function of the rpm of the cutter and the swing speed. If the above requirements are met, the cutter will also be inward feeding and flow through the cutter will be toward the suction mouthpiece.

Hull

The structural design of the hull must take into consideration the live loads imposed on it by the dredging operation. The total vertical load from the ladder on the hull and A-frame includes severe impact loads, and the "digging under" load from the cutter which may exceed all the dead load stresses. Vertical loads from the spuds should include the forces required to break a stuck spud loose from a clay bottom. Spud wells, or gates, must be strong enough to force the spuds to break first under any type of reaction or twist. The ladder and trunnions will have the full weight of dredge thrown against them when the cutter is suddenly stopped in its swing.

In general, it may be said that if a hull is designed to be structurally safe when supported at the ends or in the middle, it is strong enough to withstand the live loads imposed on it by the dredge operations.

Except for a few rare cases, all dredge sinkings have occurred due to breakage of the main pump or piping while operating. These parts are subject to abrasion and cannot economically be kept in new condition, and they are subject to severe shocks from water-hammer. Good design requires that:

(1) The discharge pipe be above deck and outside the house.

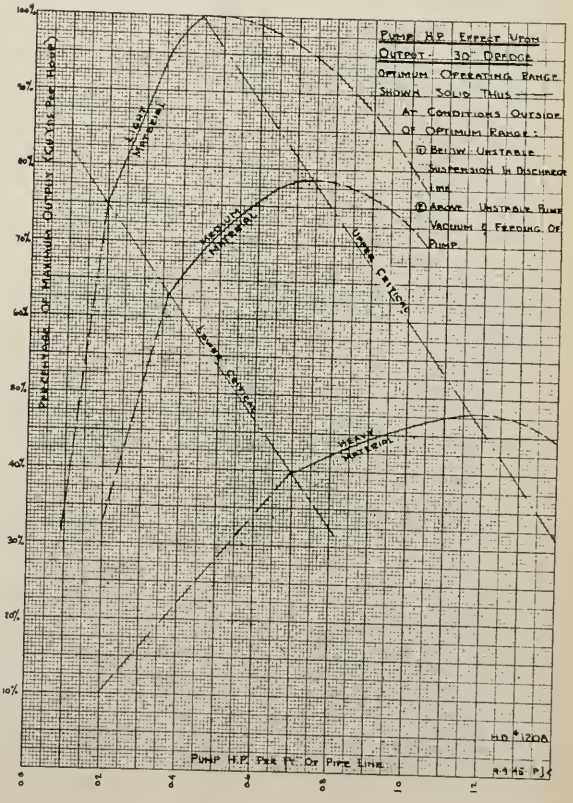
(2) The main pump be set in a watertight pump pit that can be flooded without endangering the dredge.

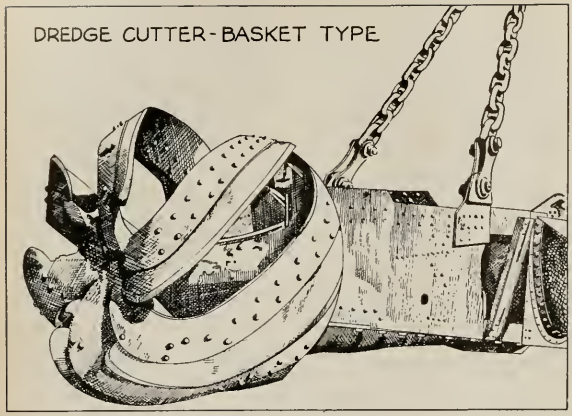
(3) The hull suction pipe be enclosed in bulkheads that can be flooded without endangering the dredge.

(4) Spud wells and ladder trunnions be isolated from the hull proper by watertight bulkheads.

(1) General: Normally, the problem posed to the designer will be to construct a dredge of stated size, pump power, cutter power and type. The prospective purchaser is presumed to have already analyzed and determined all of the various economic factors leading to this specification. An outline may be given of what should be specially considered by the designer:

(1) The main pump capacity is





the dominant function of the dredge. All other parts of the dredge must be designed to impose the least possible limitations upon continuous operation at maximum capacity.

(2) The cutter drive may encounter almost anything from boulders to sunken wrecks. Extra margin of safety must provide against "breakage" under such shock loads.

(3) Where possible without substantial extra cost, allowance should be made for probable subsequent improvements by providing, particularly: extra hull freeboard; oversize cutter shafting and bearings; and additional steaming capacity. Dredges just seem naturally to "grow" in size and power after being originally built. The additional margin provides meanwhile a safer, better dredge.

(4) Particularly important to the operator are ruggedness; simplicity; standardization and interchangeability of parts; and flexible, positive controls.

(2) Probable future limits of dredges: Dredges have developed so rapidly in recent years as to general size and power requirements that the present dredge operator and designer may well ask, "Will a dredge built now, in accordance with best experience, analysis and design, become relatively obsolete soon?"

It seems probable that dredges have now pretty well "grown up," and that limits are being approached at:

Pump power for a 30" dredge about 8000 hp.

Cutter power for a 30" dredge about 1200-1500 hp average, with peak loads of 3000 hp.

(Smaller size dredges in proportion.)

Size of dredge—30".

The basic reasons for these probable limits may be given:

(a) **Pump power limit:** The use of 8000 hp develops pump pressures up to 200#/in.2, and pipe line lengths of from 10,000 ft. (in heavy material) to 20,000 ft. or more in lighter materials.

Hence: (1) The pressure in the discharge lines requires heavier pipe and fittings, such that cost and handling problems and delays of all the auxiliary equipment begin to operate against continuous maximum operation of the dredge.

(2) The abrasive rate of wear in the pump increases directly with the pressure developed. Hence more frequent delays for renewals and maintenance.

(3) Considering the transporting action in the pipe line, the increased length of time during transport permits increased settling of the material to the bottom of the pipe, thereby reducing the maximum quantity of material which can be moved. The use of a booster for longer lines should have the effect of remixing the material and thereby restoring the transporting capacity.

(b) **Cutter power limit:** The present use of 1000-hp motors (with 2000-hp peak loads) has created severe problems of cutter blade wear, breakage of cutters, shafting, hull and trunnions, and severe maintenance, from shock and vibration of boiler tubes, condenser tubes, etc. Any substantial increase in cutter power may require radical and substantial innovations throughout the dredge.

(c) **Size of dredge limit:** Much argument exists as to the economical size of dredge, whether 24", 27" or 30". Lines larger than 30" have been used (33" lines on short discharge lines on the Mississippi River), but today there are none known in general consistent use larger than 30". Briefly stated, the general conclusion seems to be:

(1) Disposal problems increase with the square of the pipe diameter.

(2) Feeding of the pump must increase also with the square of the pipe diameter.

(3) Both these problems, with 30" dredges, are so varied and difficult that in general a 30" dredge may be operating at maximum pumping capacity less than 70% of the operating time.

(4) Considered as an economic curve of plotting possible unit costs (per cy) against size of dredge, the 30" dredge unit costs are down to the flat part of the curve, where a small increase or decrease in size would show but little possible change in unit costs. Hence larger sizes seem unwarranted.

Future Improvements in Dredges

Possible future improvement to further improve performance and unit costs in large outputs under good conditions are probably limited to a cumulative total of small individual improvement in operating efficiency, such as higher economy power plants, more flexible controls, and concentration on design of the dredge and attendant plant to reduce time delays. Contrarily, there should be a wide possibility of improved performance and unit costs under the tougher operating conditions, and an increased ability of the dredge to perform economically work which up to a few years ago was considered beyond practicability for a hydraulic dredge.



A British-built Escort Carrier, H.M.S. Biter. (All photographs British Official Photographs)

War's Impact on British Shipyards

By Donald Maxwell

THE SHIPBUILDING industry of Britain, normally the largest industry of its kind in the world, is now being geared to the tasks of reconstruction.

There have been many changes in the wartime development of most other industries, but in shipbuilding the changes in procedure and methods compared with the pre-war period have been negligible.

To understand the position of British shipbuilding, as it emerges from the war scene, it is necessary to appreciate the nature of the problem with which the industry was confronted during the war.

The extent of Britain's shipbuilding effort in wartime was governed by the insatiable demand for aircraft. When the broad production pattern was laid down in the spring and summer of 1940, the bomber was the only weapon with which Britain, alone, could ever hope to strike directly at her enemy. Aircraft production therefore absorbed most of the potential pool of industrial labor.

The main privately-owned shipbuilding and ship-repairing establishments, which in 1939 employed a total of about 90,000 workers, had doubled their man power figure when the war reached its peak in 1943. But nearly half the labor, about 80,000 workers, were engaged in conversion work, and repairs, naval and mercantile, which always had the highest priority; and of the remaining labor force, nearly two-thirds were engaged on naval construction.

In short, merchant ships had, firstly, to be kept in service; secondly, to be more adequately protected; and thirdly, to be turned out new from the shipyards. The result of this low priority was that the man power devoted to the construction of new merchant ships, so far from increasing, actually declined. In 1937-38 about 49,000 men were employed on the construction of new ships. By early 1940 that figure had been halved; and at the peak period, at the end of 1942, only 41,000 men were engaged on this work.

Production

The production of 1,300,000 tons gross (say, two million tons deadweight) in 1942 appears small indeed beside the colossal mercantile output of the United States yards. But when it is realized that this figure was achieved by a smaller labor force than that responsible for 1938 production record of 1,030,000 tons gross—the highest for eight years; that the labor force had been "diluted" with women and new recruits; that production schedules were subject to constant interruption by bombs as well as various priority demands; that a rigid "blackout" was in operation; and that, owing to the accumulation of defensive measures, each ship represented much more work per ton than formerly: when all this is borne in mind, it will be understood why the British mercantile

(The author is editor of the "Shipping World" of London.)



A British Navy floating kitchen (converted Thames barge) off the Normandy beachhead.

shipbuilding industry is proud of its war achievements.

Over the five years, 1940-44, the average merchant tonnage completed per annum was 1,096,000 tons gross. The British program was never one of "volume," such as that of the United States or even Canada. To an increasing degree, it became a program of special type construction to meet war needs, subject always to sudden modification as fresh strategic demands appeared. While this feature involved some sacrifice in terms of tonnage, the very fact that British yards were not enmeshed in a highly-geared mass-production effort, dependent on a constant flow of standardized products, meant that such interruptions could be borne without major upheaval.

It is in ship design that circumstances of war have brought more changes than in shipbuilding methods. So far as construction technique was concerned the need was for greater speed, but mass-production not being a settled policy, there was no call for any fundamental change in the methods evolved over the years as those most suited to the individual shipyards and the work which they understook. Thus the changes which may be seen today are mainly an intensification of pre-war trends.



The first vessel of the Canadian Pacific Railway Company's post-war cargo fleet, the 10,000-ton turbo-electric vessel Beaverdell, shown during launching from the shipyard of Lithgows Ltd., Port Glasgow.

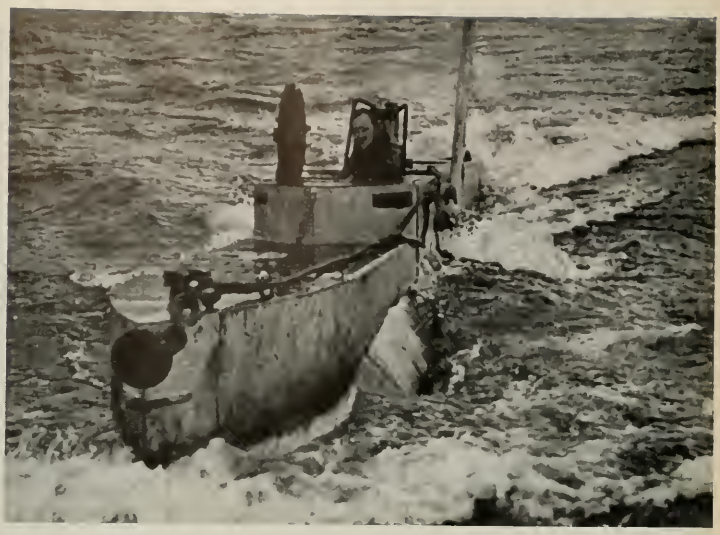
Welding

Wider adoption of welding is probably the outstanding feature of development during the past six years. As in the United States, this was partly dictated by the labor position, for it is easier to train welders than riveters, and welding is a suitable type of employment for women. The proportion of welding done varies from yard to yard, but in general it may be said that there has been a threefold increase in welding plant. Nevertheless, it is still considered that hydraulic riveting, for which a fair amount of new plant has also been installed, is more rapid and more economical than welding.

Greater use of welding, gas cutting and so on has not been without influence on shipyard layout. It has also affected structural design, in which the development of a new steel section for welding bulkhead stiffeners so as to avoid turning over large slabs of structure under fabrication is among the outstanding examples.

Shipyard Layout

In regard to layout, there have been instances where the number of berths have been reduced, more effort and space devoted to prior construction and an improvement in production efficiency secured. In



One of Britain's midget submarines under way, with a member of her three-man crew in the hatchway.

British yards, the optimum manning position is reached at a little over 300 workpeople per berth.

Following damage by air raids at one yard, the shop space was designed so as to allow a considerable increase in welded preconstruction under cover. Deck, bulkhead and other sections are now fabricated in units of five to 15 tons, partly by automatic welding machines imported from the U. S. A.

This yard was established during the last war, and the site is not cramped in the way that some British yards, developed over periods of 100 years, are restricted. It is possible here to see the influence, on a relatively small scale, of the shipbuilding technique which United States yards have advanced to such a high pitch during the war years.

It is notable, however, that one of the highest production records of the war was achieved by a six-berth shipyard founded in the days of sail and now hemmed in tightly by public roads and a phalanx of tenement houses.

Together with the extension of reconstruction inside shipyards, assistance from the structural steel industry was obtained by the prefabrication of steel in small units before delivery, to the extent of 50 to 60 per cent of the steel weight of plates, angles and rivets. It was in this connection that there arose what is perhaps the most interesting development in design.

Hull Design

It was desirable, in the case of these so-called "prefabricated ships," to extend the length of parallel middle body in order to simplify steel work at outside establishments.

A series of experiments eventually showed that, working from a basic model of normal ocean tramp type, the parallel body could be increased from 69 ft. to 142 ft., bilge radius being increased from 4 ft. 6 in. to 8 ft. rise of floor and tumble-home eliminated, and yet a hull produced which showed an improvement in resistance of from 6.2 to 9.4 per cent within the applicable speed range, despite a decrease in the length-displacement ratio and an increase in the block coefficient. The subject is being further investigated, but it appears evident that in slow-speed ships the adoption of easier bilges than formerly will be one of the results of this essay in wartime simplification.

Small Craft

Among the most interesting wartime shipbuilding measures have been those concerned with the construction of small craft.

An example is provided by a series of 70 ft. tugs required for general harbor purposes. The aim was to build these craft without interfering with existing schedules. A special straight-line, or hard chine, form was evolved in which all curved plates curved in one direction only, without twist. Complete transverse sections were "farmed out" among inland structural firms which had no previous experience of shipbuilding. The welded sections were delivered to the launching site in eight units complete in every detail, and there they were joined together simply by circumferential welds. The vessels were launched at the rate of about one every four and a half days.

This was another production device which showed up surprisingly well from the design point of view, for it turned out that, at slow towing speeds, the straight-lined form was an improvement on the orthodox. The same type of hull form was used for prefabricated 400-ton tankers.

A wartime development which is expected to stay is the welded prefabricated stern frame. This was adopted to relieve the pressure for heavy steel castings, and many of the stern frames built up in web formation were produced in shipyards.

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MODERN MOTORSHIPS

By George H. Lienhard



C1-A motorship Marmacdale, built at Pennsylvania Shipyards, Beaumont, Texas.

THE AMERICAN MOTORSHIP is truly a modern vessel, because the majority of motor-driven vessels have been built in the last five or six years. Even relatively speaking, the motorship is modern, because the first motorship to sail the seas was built in 1913. This vessel was the Selandia. Both the hull and the engine were built by Burmeister & Wain at Copenhagen, Denmark. This vessel sailed the seas until sunk by a German submarine in the Atlantic sometime in 1943. This was quite a record, because it is doubtful if the first steamship sailed 30 years or if the first sailing vessel sailed for 30 years before departing for Davey Jones' Locker. And let us not think of the Selandia as a small ship, because she was about the size of a modern C-1 vessel.

During the Selandia's lifetime, from 1913 to 1943, we have gradually witnessed this growing form of sea power. While the motorship was long neglected and overlooked in the American Merchant Marine, European nations went ahead with the development and building of motorships to the extent that they had more diesel-powered vessels than they had steam. For instance, in 1938, the last year before the war, there were under construction in the United States 15 steamships and one diesel ship. In the entire rest of the world, there were 102 diesel ships being constructed and only five steamships. These were all large ocean-going vessels. Since we have no available figures on European or foreign production since the war, this article will deal with the various types of American motorships which were built from 1940 until 1945.

Between World War I and World War II, shipbuilding in the United States declined almost to the vanishing point as far as ocean-going ships were concerned. Our merchant marine consisted mostly of steamships left over from the last war. From 1918 to 1938 very few cargo ships were built and very few were diesel powered. However, by the end of 1944 we find that the Navy has more floating horsepower than exists in the land-powered generating equipment of the nation, and a large percentage of the Navy's horsepower, in fact more than 30 million horsepower, comes from diesel engines. During World War I the Navy had only 150,000 diesel horsepower.

C-2 Motorships

When the United States Maritime Commission's building program was started in 1938, a large portion of the ships to be built were to be motorships. The Maritime Commission had started with three basic designs for cargo ships, namely, the C-1, the C-2 and the C-3. After the war started, this motorship program was expanded to include the BT-1 tanker and the BK-2 tanker, the C1-M-AV1 coaster vessel and the Victory ships.

(The author is marine engineer, Nordberg Manufacturing Co.)

The first motorships contracted for were the C-2's which were built by the Tampa Shipbuilding Company at Tampa, Florida. Eleven ships of this type were built at Tampa and 14 were built at Sun Shipbuilding Corporation, Chester, Pennsylvania. The principal dimensions for the C-2 are as follows:

Length, over-all	459′ 0″
Beam, molded	63′ 0″
Depth, molded to shelter deck	40′ 6″
Load draft, molded	25′ 0″
Displacement, full load	13,900 tons
Deadweight	8,767 tons
Gross tonnage	8,228 tons
Fuel capacity	1,501 tons
Shaft horsepower	6,000
Service speed	15½ knots

The first motorship delivered from the Tampa yard was the Sea Witch. This is a standard Maritime Commission C-2 design. It was delivered in 1940 from the Tampa Shipbuilding Company and was designed by George Sharp, Naval Architect of New York. The vessel is propelled by two 9-cylinder Nordberg marine diesel engines rated 3200 brake horsepower at 225 rpm. These engines deliver a total of 6000 shaft horsepower through hydraulic couplings and gear reduction sets to the single propeller at 92 rpm. They are capable of developing a total of 6600 shaft horsepower at a propeller speed of 95 rpm. This is a 10% overload and can be operated continuously under this condition. A maximum of 7500 shaft horsepower for a period of two hours can be maintained at a propeller speed of 99 rpm. At the present time the Sea Witch has traveled approximately 300,000 miles in approximately 20,000 hours of running time. Originally operated by the United States Lines on their Far Eastern run, the Sea Witch has been serving as an Army Transport during the war times. The log of the maiden voyage of the Sea Witch is shown in a table.

The Sea Witch is a typical example of how the standard Maritime Commission design could be converted for wartime use. The tween decks were rearranged to carry troops. The lower cargo holds are still used for carrying cargo and supplies. Most of the sister ships of the Sea Witch are serving in the Navy as ammunition carriers and supply ships.

When the Japanese attacked Man-

FROM THE LOG OF THE M.S. SEA WITCH ON MAIDEN VOYAGE

From	To	Dates 1940	Obs. Dist. Naut. Miles *P to P	Speed Knots	Fuel per Day Bbls *P to P	Total Fuel Bbls *P to P	Obs. Naut. Miles per Bbl *P to P
Tampa	Baltimore	July 31 – Aug 4	1166	14.51	106	376	3.1
Baltimore	Philadelphia	Aug 8 – Aug. 9	128	13.19	124	51	2.72
Philadelphia	New York	Aug 10 – Aug 11	130	15.20	158	35	3.36
New York	Norfolk	Aug 21 – Aug 22	246	15.02	178.8	122	2.01
Norfolk	Newport News	Aug 22 – Aug 23			No data		
Newport News	Savannah	Aug 23 – Aug 25	453	15.17	139	173	3.62
Savannah	Cristobal	Aug 27 – Sept 1	1555	15.11	133.3	658	2.36
Cristobal	Balboa	Sept 1 – Sept. 2			Canal transit		
Balboa	San Pedro	Sept 2 – Sept 10	2940	13.41	143.7	1,157	2.54
San Pedro	Manila	Sept. 12 – Oct 3	6978	14.90	151	2,967	2.37
Manila	Shanghai	Oct 3 – Oct 9	1247	13.03	153.9	321	2.24
Shanghai	Hong Kong	Oct 11 – Oct 14	809	14.31	171.1	349	2.3
Hong Kong	Manila	Oct 16 – Oct 18	630	14.60	112.9	203	3.13
Manila	Mauritius	Oct 18 – Oct 19	118	15.80	135.1	42	2.8
Mauritius	Thursday Island	Oct. 22 – Oct 29	2271	13.35	139.9	856	2.65
Thursday Island	Brisbane	Oct. 29 – Nov 2	1262	15.46	142.6	485	2.6
Brisbane	Sydney	Nov. 6 – Nov 8	478	14.73	153.3	210	2.47
Sydney	Balboa	Nov 13 – Dec. 7	7789	13.46	153.3	3,641	2.14
Balboa	Cristobal	Dec. 7 – Dec. 7			Canal transit		
Cristobal	Boston	Dec. 7 – Dec. 14	2146	13.88	144.1	928	2.31
Boston	Norfolk	Dec. 19 – Dec. 21	544	14.08	118	189	2.89
Norfolk	Philadelphia	Dec. 21 – Dec. 22	140	14.00	114.2	48	2.91
Philadelphia	New York	Dec. 27 – Dec. 30	129	15.26	117.1	34	3.14
*P to P Pilot to Pilot	Totals & Weighted Averages		31,180	14.53	146.3	13,082	2.38

LOG OF MAIDEN VOYAGE OF M/S STAR KNOT

Long Beach	Running Time	Obs. Miles	Slip %	Obs. Speed	Fuel Oil Barrels	Lube Oil	Engine rpm
Eniwetok	18D-12H-34M	4701	-0.15	10.57	961	336	166.0
Palau	6D-10H-03M	1689	-0.83	10.84	342.8	180	167.6
Tacloban*	3D- 9H-29M	773	8.2	8.25	94.8	126	150.7
Biak*	6D- 3H- 6M	1276	3.04	8.8	150.3	52	151.2
Moratai*	2D-13H- 3M	521	4.5	8.57	71.4	6.5	139.6
Tarakan**	4D-26H-57M	647	43.0	4.69	153.25	70.	128.2
Moratai*	2D-20H-55M	653	-5.2	10.13	114.95	10.	150.5
Tarakan*	2D-21H-57M	637	8.4	9.59	126.45	106.	160.9
Moratai*	2D-19H-22M	627	5.8	9.91	100.45	13.5	143.8
Hollandia*	4D- 3H- 6M	849	5.2	8.95	148.85	0.	145.0
Lae*	3D- -12M	610	20.2	7.66	118.85	29.5	147.7
Biak*	3D-21H-49M	929	4.45	9.92	147.75	146	146.1
San Francisco*	27D-19H-40M	6382	12.2	9.89	1389.2	310	168.2
Total	89D-07H-13M	20305			3520.05	1384.5	

* Indicates convoy or running at reduced speed due to weather conditions.

** Indicates barge in tow on this voyage. This trip also at reduced speed.

LOG OF MAIDEN VOYAGE OF M/S CAPE SAN BLAS

	Distance Pilot to Pilot	Mean Draft	Slip %	Running Time – Port to Port	Average Speed Knots	Obs. Miles Per Bbl. of Fuel	Bbls. Fuel Per Day, Ave.	Fuel Consumed Port to Port
Galveston								
Panama Canal	1525	24′ 0″	10.2	4D-16H-55M	13.5	2.91	111.4	520
Sidney	7880	23′ 8″	7.17	23D-08H-19M	14.06	2.98	112.8	2637
Port "A"	48	18′ 4″	.98	3H-11M	15.0	3.20	112.5	15
Sidney	48	13′ 8″	-6.25	2H-45M	17.45	3.69	113.2	13
San Francisco	6865	14′ 7″	3.36	18D-20H-47M	15.32	3.13	117.3	2214



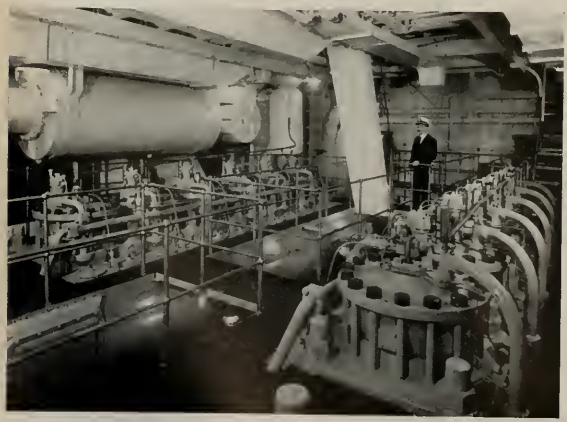
C1-A engine room views. Left: Looking oft between main diesel engines ta reduction gear set. Right: Shawing central control stand and gage board.

ila, during the early days of the war, the Sea Witch was in port. Having to make a run for it to save her life, she was forced to run at a 25% overload for several days. In spite of such a grueling voyage, and after five years of wartime service, the Sea Witch is still maintaining her "Maiden Voyage" performance.

The Nordberg main engines on the C-2's are of the two-cycle, crosshead, mechanical injection type, with gear-driven rotary scavenging blowers. Both engines are controlled from a central control stand through a single lever, or each engine may be controlled separately.

C-1 Motorships

The next popular type of motorship to enter the marine picture is the C-1 single-screw cargo ship. Fifty-six motorships of this type were built. Forty-six of these were built at Pennsylvania Shipyards, Beaumont, Texas, and are propelled by two Nordberg six-cylinder marine diesels. Five were built at Western Pipe & Steel Company in San Francisco, and are powered by Busch-Sulzer diesels, and five were built at Seattle-Tacoma Shipyards in Seattle, and are powered by Hamilton M.A.N. diesels. One of the best known and one of the first to be delivered of this type was the M.S. Mormacdale. The Mormacdale was delivered in February, 1942, and is operated by the Moore-McCormack Lines. Since that time this vessel has been serving as an auxiliary to the armed forces and has traveled a distance of approximately equal to ten times around the world. O. T. Redden, the chief engineer, who took the Mormacdale from the shipyard, is still aboard and says that he likes the ship better than any he has sailed on.



C1-A upper engine room, looking forward, showing cylinder heads.



Motorship Sea Witch.

The principal dimensions of the C-1A vessels are as follows:

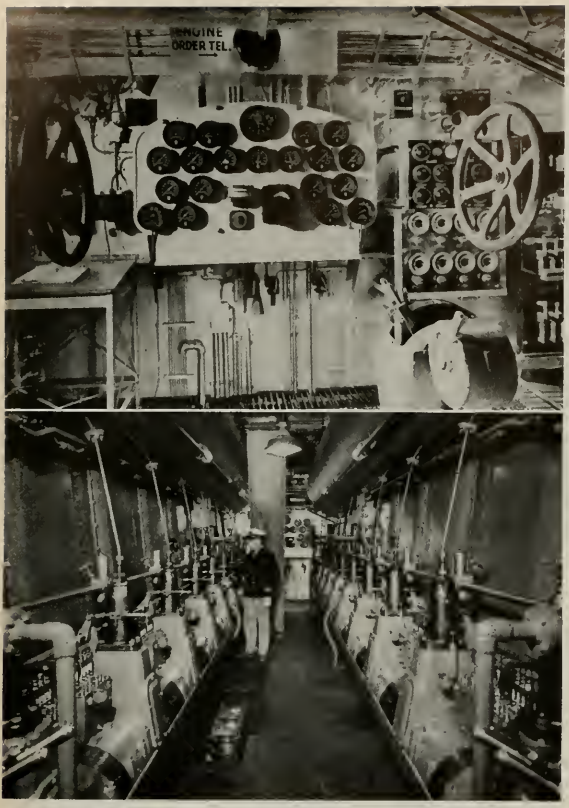
Length, over-all	413′ 0″
Depth, molded to shelter deck	37′ 6″
Draft, loaded	23′ 6″
Displacement, full load	11,000 tons
Gross tonnage	5,138 tons
Fuel capacity	9,640 barrels
Shaft horsepower	4,000
Service speed	14 knots

The C-1 power plant consists of two Nordberg marine diesels driving through electro-magnetic couplings and gear reduction sets to the 90-rpm propeller. These engines are of the trunk piston, two-cycle mechanical injection type. Scavenging air is supplied by a reciprocating pump driven directly from the forward end of the crankshaft. The normal rating of each 21½″ bore by 29″ stroke engine is 2075 brake horsepower at 220 rpm, or a total of 4000 shaft horsepower at 90 rpm on the propeller. These engines are capable of running continuously at 10% overload and will carry 25% overload for two hours. Both engines are operated from a central control stand and can be started, stopped, reversed and regulated by a single lever for both engines, as desired. The C-1 motorship with twin engines and electro-magnetic couplings is just about the most flexible power plant afloat. It can be maneuvered by the flip of the wrist. With one engine idling in the go-ahead position and the other idling in the go-astern direction, the propeller direction can be controlled by magnetizing the magnetic coupling on the engine which is running in the desired direction.

Captain R. T. Burcroff of the M.S. Cape Gaspe, a C-1A, reported that this ship had to take a damaged warship in tow from Leyte to Hollandia. He said that he had no trouble in get-

View along the upper gallery, showing the cylinder heads of the two engines on the Sea Witch.





Upper: Controls for the two 3000-shp engines installed in the Sea Witch. Lower: View along the passageway between the two engines on the ship.

ting a line from his ship to the stricken vessel because of the ease of maneuvering a ship with twin engines and electric couplings.

Captain Leif Christensen of the Cape Barrow said that his ship maneuvered so well because of the machinery installation that he seldom used a tugboat. Many steam men have criticized the marine diesel because it was so hard to start and stop, but this is not true of the modern motorship. Crash stops from full ahead to full astern in seconds are now common practice.

Among marine engineers this type of motorship is one of the most popular. I have known many men to go from one "Cape" ship to another and refuse any other kind. Four of these ships have been turned over to the Norwegian Shipping & Trade Mission for their operation, and one has been assigned to the Dutch Government. These operators are very enthusiastic and have the highest praise for these modern American-built motorships. This praise is worthy of note, coming from two countries whose merchant ships are predominantly propelled by diesels. The data shown in one of the tables are from the log of the Motorship Cape San Blas on her maiden voyage. This is typical of the C-1A ships.

Coastal Motorships

Soon to become a familiar sight on the Seven Seas and in the far-flung ports of the world, are the 270 C1-M-AV1 coaster vessels, of which 173 are propelled by Nordberg marine diesel engines. Seventy-three of this type are propelled by Hamilton M.A.N. engines and 24 by Busch-Sulzer engines. While these vessels were built to fill a wartime need to transport cargo to the military and naval bases in the Pacific operations, their unusual maneuverability, low-cost operation and dependability of the propelling machinery will render them valuable as coastal vessels and they will have a real usefulness as a permanent part of America's post-war merchant marine. Some of the C1-M-AV1 ships are operated by the Navy, some by the Army and some by the War Shipping Administration. Fifteen of this type ship have been arranged to accommodate dry, chilled and frozen cargoes. The principal dimensions of this ship are:

Length	**338′ 6½″**
Beam	**50′**
Draft, designed	**18′**
Displacement at designed draft	**6,240 tons**
Service speed	**11 knots**

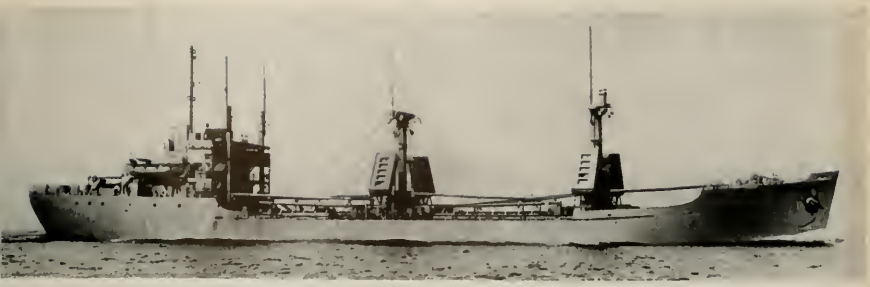
The propelling unit delivers 1700 shaft horsepower at the normal speed of 180 rpm on the propeller shaft. The engine is capable of continuous operation at a 10% overload and 25% overload for a two-hour period. At the maximum rating, the engine develops 2125 horsepower with an engine speed of 194 rpm. The design of the engines, in general, is identical to those in service in the C-1A and C-2 type cargo ships. They are six cylinder with a bore of 21½″ and a stroke of 29″. The engine is of trunk piston construction with attached scavenging pump. One of the tables in this article is an excerpt from the log of the Motorship Star Knot on her maiden voyage. This performance is typical on all of this type vessel.

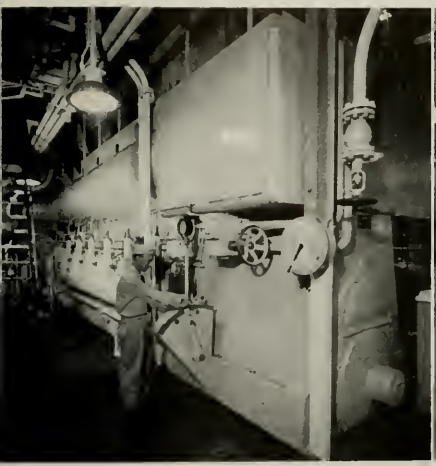
Motor Tankers

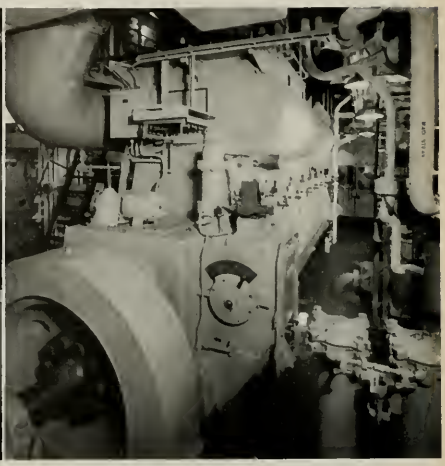
Another type of Maritime Commission vessel, designed by Joslyn & Ryan of San Francisco, is the C1-M-BT2 Tanker. The principal dimensions are as follows:

Length, over-all	**325′ 2″**
Loaded draft	**19′**
Beam	**48′ 2⅜″**
Shaft horsepower	**1,400**
Speed	**10 knots**
Capacity	**30,000 barrels**

(Page 692, please)

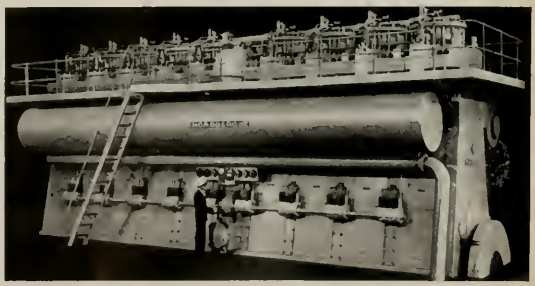








At top of page is a starboard view of a fully-loaded C1-M-AV1 coastal cargo vessel. At center left is a view of the starboard side of engine room, looking aft, showing simple one-lever control. Center right shows starboard side of main engine, looking forward. At lower left is the upper engine room, showing cylinder heads of the main diesel engine. At lower right is the 6000-shp main diesel engine for the motorship Emery Victory.



Navy Day
October 27, 1945



U.S.S. MISSOURI—"MISSION ACCOMPLISHED!"

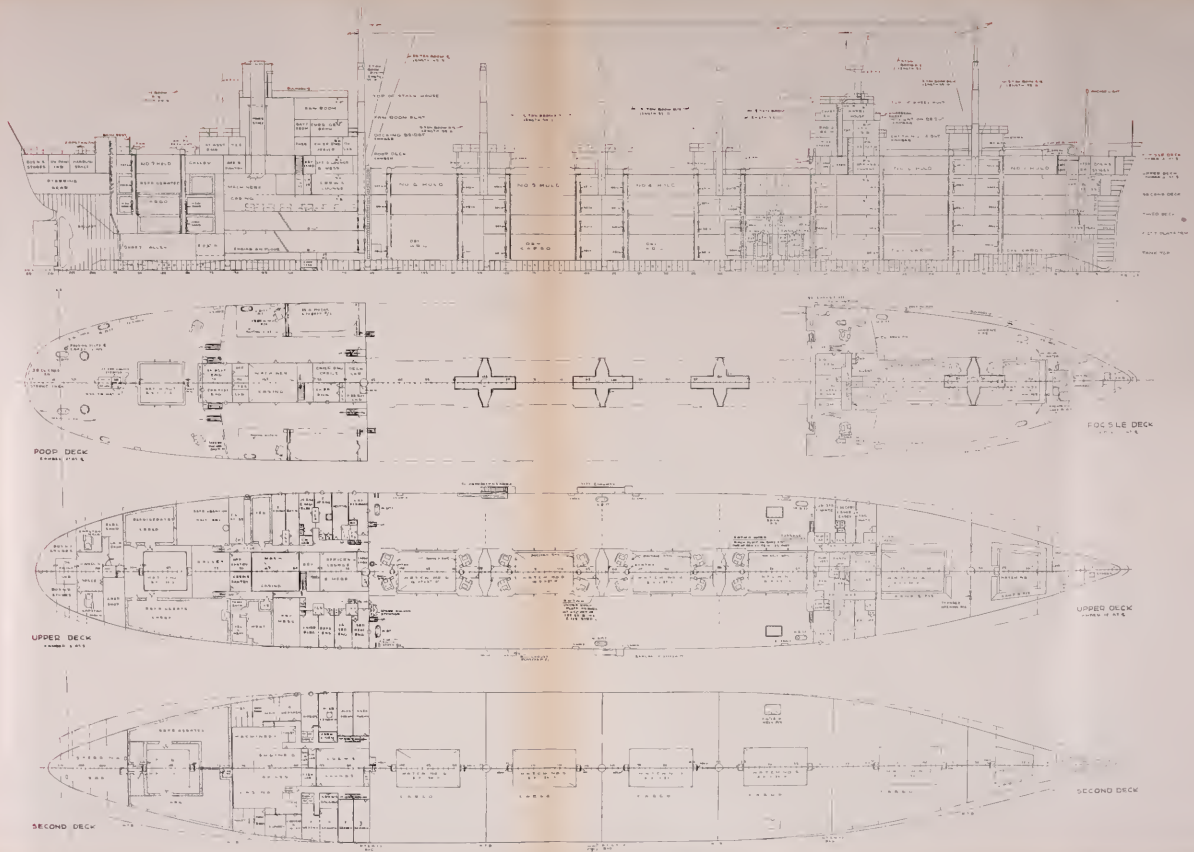
"San Francisco, we give you back your Navy. Its strength is your safeguard."

ARTEMUS L. GATES,
Under Secretary of Navy,
speaking to San Francisco
Chamber of Commerce and
Commercial Club.

"As we see the victorious Navy sailing into San Francisco Bay we humbly realize that the Lord of Hosts is with us yet."

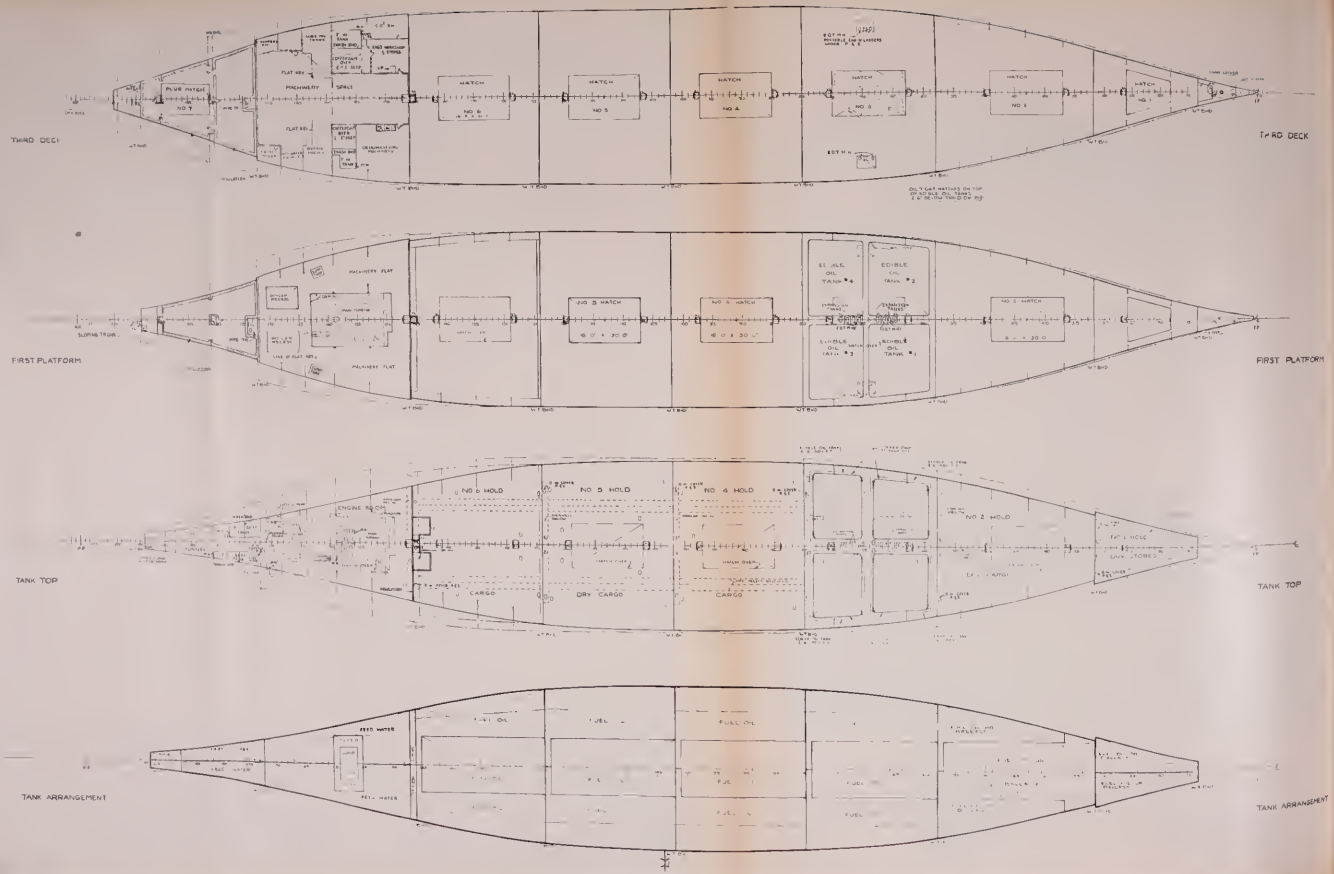
ERNEST INGOLD,
Chairman,
S. F. Navy Day Committee.

THE C-4 CARGO LINER



Inboard Profile and General Arrangement Plans.

THE C-4 CARGO LINER



Deck, Tank Top, and Tank Arrangements.

The C-4 Cargo Vessels

THE LATEST U. S. M. C. STANDARD FREIGHTERS

Based largely on a design developed for the United States Intercoastal trade the U. S. Maritime Commission contracted with various American shipyards to build 75 large cargo vessels of the C-4 type. As of September 1, 1945, some 53 of these vessels had been delivered, most if not all of them in special types for military use ranging from Army Transports to hospital ships.

The Kaiser Company, Inc., shipyards, Richmond No. 3, California, and Vancouver, Washington, have delivered 18 C-4 Army Transports and are now working on the completion of 10 as general cargo ships. As will be noted from the profile and general arrangement plans herewith, the C-4 is a big husky cargo carrier with machinery aft and with the entire middle body of the hull given over to large cargo holds. The general characteristics are given herewith.

Of the cargo vessels in this class now under construction, allocations have been made to several shipping firms including Luckenbach S. S. Co. and American-Hawaiian S. S. Co.

The profile shows a raked bow, modified cruiser stern, long forecastle and poop erections, and nine watertight bulkheads extending to the upper or weather deck. The ten compartments formed by the watertight bulkheads are, starting at the bow: forepeak; hold No. 1; hold No. 2; hold No. 3; hold No. 4; hold No. 5; hold No. 6; machinery space; hold No. 7 (refrigerated); and after peak. Holds No. 1 and No. 7 are served by two 5-ton booms and two cargo winches. Each of the other five holds is served by four 5-ton cargo booms and four cargo winches making a total of 24 5-ton booms and 24 cargo winches. In addition a 50-ton 65-foot-length boom is fitted at the center line on the after end of the upper deck hatch to hold No. 6. All winches are electric motor drive of the U. S. M. C. standard unit type, capable of handling a 5-ton load at 300 f.p.m. rope speed.

An electric drive, double wildcat windlass is installed on the forward end of forecastle deck capable of raising both anchors and anchor chains simultaneously. This windlass, on the ships building at Richmond No. 3, is built by the American Hoist and Derrick Co. Each vessel carries four anchors. Two of these are stockless bowers of 12,740 lbs. each, one a stockless spare bower of 10,815 lbs., and one a stockless steam anchor of 4,550 lbs. Cable carried includes: 300 fathoms of 2 9/16 inch cast steel stud link anchor chain; 105 fathoms 6 x 24 1⅜ inch diameter wire cable; 140 fathoms 6 x 24 2 1/16 inch diameter wire towing cable; two 90 fathom hawsers 6 x 24 1 inch diameter; and three 90 fathom 7½ inch circumference manila warps.

The hatch openings on the weather decks are all 18′ wide by 27′ long with the exceptions of No. 1 and No. 7, which are respectively 18 ft. wide by 17 ft. long, and 18 ft. wide by 17 feet 3 inches long. On the lower decks all of these hatches are increased in length by three feet.

Mooring capstans are installed port and starboard aft on the poop deck. These units are of the vertical shaft type with electric drive on the deck below housed in a special enclosure.

Navigation

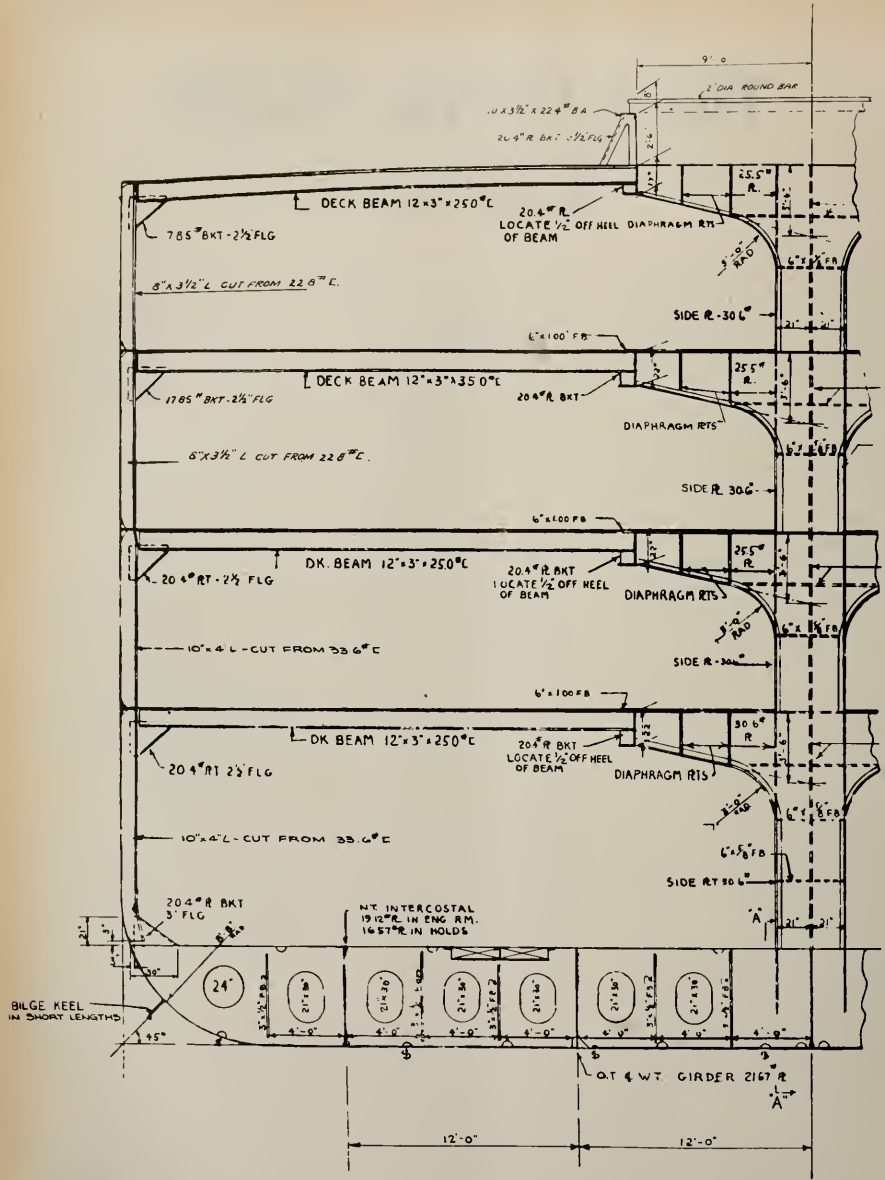
At the after end of forecastle deck a bridge erection carries a navigating bridge deck, and a captain's bridge deck. On the navigating bridge deck is located the wheelhouse and chart room. The top of wheelhouse will be decked over with a wooden deck, covered by an awning, and fitted with a raised platform for a steering station that supports a binnacle, a gyrocompass repeater, a speaking tube, and a steering wheel.

In the wheelhouse will be installed the usual echo sounding device, gyrocompass repeaters, gyropilot, smoke detection cabinet, signal light control board, shaft revolution indicator, engine room telegraph, steering wheel and telemotor. The chart room immediately aft of the wheelhouse will be equipped with all necessary charts, signal flags, and instruments for obtaining fix on charts.

Accommodations

Accommodations for the captain comprising a stateroom with private bath and a commodious office are located on the captain's bridge. Here, also, is located the radio room equipped with radio installations of sufficient power and scope to maintain constant communication with either end of any route on which the vessel may be working. The captain's bridge level on this superstructure has an open walkway all around the enclosure.

On the forecastle deck level of the bridge erection there are two guest rooms, a room for radio operators, a room for the purser and pharmacist, and a room for the master gyrocompass. Below on the upper deck the



SECTION AT HATCH END BEAMS

accommodations take the full beam of the ship and include: an office for the first officer; three staterooms with private shower and toilet for the 1st officer, the 2nd officer, and the 3rd mate; a room for the junior 3rd mate, and a room for a deck cadet and an engine room cadet, the two rooms having a common shower; a commodious officers' lounge; a pantry; a steward's locker; an electrician's shop; a slop chest; and a room housing the fan that takes care of the forced ventilation of these quarters.

Around the machinery casing aft are grouped the accommodations for the engineer officers, and the crew. On the poop deck level are: an office for the chief engineer; and stateroom with toilet and shower for the chief engineer, the 1st assistant and the 2nd assistant.

On the upper deck level are: the galley; the officers' and the crew's pantry; refrigerated and dry galley stores; the officers' lounge and mess; the hospital; a room housing the Cargocaire system equipment; the crew's mess; and nine staterooms with private or communicating shower housing the 3rd assistant, the junior 3rd assistant; the refrigerating engineer; the chief electrician; the chief steward; the two junior engineers; a junior engineer and assistant electrician; a boatswain; and two cooks.

On the second deck level are housed 30 members of the crew, the crew's lounge, and ample provision of washrooms, showers and toilets.

Special Cargo

Provision is made in Hold No. 3 for carrying edible oils in bulk, by the installation of four large tanks which occupy the entire hold below the third deck, and are built into the hull with a steel seating on the tank tops and with space and access all around between the ship shell and the ship bulkheads and the sides of the tank. Each tank is fitted with an expansion trunk.

In Hold No. 7 provision is made for considerable tonnage of refrigerated cargo on the upper, second, third, and first platform deck levels. A total of seven large refrigerated cargo rooms are installed. The refrigerating machinery is located on the upper deck level, port side, alongside one of the refrigeration chambers.

Propulsion Machinery

Two Babcock and Wilcox water tube boilers supply steam at 450° psi to a double reduction geared Westinghouse turbine driving the single screw shaft. The boilers are mounted above and aft of the turbine. The plant is of standard U. S. M. C. type and auxiliary equipment, and is rated 9000 shp. The boilers are served by automatic combustion control. Feed water is handled in a closed system with three stage heating by steam bled from the main turbine, the deaerating heater being of sufficient capacity to act as a hot well.

The turbines are cross compound with the low pressure unit mounted on and exhausting directly into the condenser.

In this plant, as in all U. S. M. C. marine turbine installations, every effort is made to squeeze the last B.T.U. out of the steam by using hot drains from the various heating stages to augment the stage lower down and by perfecting the insulation and reducing the steampipe lengths. Such a plant should give a fuel economy of approximately 0.56 pounds of 18,000 B.T.U. oil per shaft horsepower hour and should drive this ship at better than 18 knots sea speed loaded.

Cargo Protection

It is of special interest that these vessels are to be equipped with the Cargocaire system of air condition for the cargo holds. This system insures an ample supply of dehumidified air at proper temperature and eliminates harmful condensation of moisture on the cargo and on the inner surfaces of the hull in way of cargo spaces. Thorough protection against cargo fires will be given by smoke detection pipes in each cargo space connecting with an indicator and alarm cabinet in the wheelhouse and by a carbon dioxide system with centralized valve control.

In a word the C-4 cargo carriers will be finished with the same high class equipment and the same meticulous attention to detail that characterizes the well-known C-2's and C-3's. These ships should make ideal freighters on the intercoastal and the transpacific runs and will undoubtedly prove to be very popular if their cost is within reasonable limits for the trade involved.

For the information from which this article is compiled we are indebted to the U. S. Martime Commission and to the Public Relations Department of the Richmond Shipyards.

General Characteristics

Length B. P.	496′ 0″
Length O. A.	523′ ¼″
Beam	71′ 6″
Depth	43′ 6″
Draft designed (Load)	32′ 0″
Gross Measurement	10,700 Tons
Deadweight	14,500 Tons
Power normal	9,000 s.h.p.
Steam Pressure	450 psi
Steam Temperature	750° F
Probable Speed	18 knots plus

PACIFIC COAST SHIPBUILDING

The following statistical statement shows the shipbuilding status of the Pacific Coast as of October 15, 1945, for both mercantile and naval construction. To this list must be added a fairly large volume of tuna clipper and purse seiner vessels now building. Some of the yards both in naval and in merchant building have considerable work ahead for delivery well into 1946 and beyond. The rush shipbuilding of the hectic war rush is gone, but for same years to come the shipbuilding and ship repairing business on the Pacific Coast will be on a scale greatly exceeding its pre-war volume.

U. S. MARITIME COMMISSION

Vessels Under Construction or Under Contract or Recent Deliveries in United States Shipyards as of October 15, 1945

Builder SHIPS DELIVERED	No. of Vessels	Type & Size	Power	Owner	Est. Gross Tons D.W. Tons
CALIFORNIA—					
California Shipbuilding Corporation, Terminal Island, California	2	VC-2-SAP2 Cargo Vessel 436′ 6″ x 62′ x 38′	Turbine 6,000 h.p.	U.S.M.C.	7,600 ea. 10,700 ea.
Consolidated Steel Corp., Wilmington, California	9	C1-M-AV1 Cargo Vessel 320′ x 50′ x 29′	Diesel 1,700 h.p. Machinery aft.	U.S.M.C.	3,800 ea. 5,000 ea.
	10	C2-S-B1 Cargo Vessel 435′ x 63′ x 40′ 6″	Turbine 6,000 h.p.	U.S.M.C.	6,200 ea.
Bethlehem-Alameda Shipyard, Alameda, California	2	P2-SE2-R3 Pass. & Cargo 573′ x 76′ 6″ x 43′ 6″	Turbo-electric 20,500 h.p.	Amer. Pres. Lines	15,450 ea. 10,000 ea.
Kaiser Richmond No. 3, Richmond, California	2	C4-S-A3 Troop Transport 496′ x 71′ 6″ x 43′ 6″	Turbine 9,000 h.p.	U.S.M.C.	11,300 ea. 5,500 ea.
	2	C4-S-A4 Cargo Vessel 496′ x 71′ 6″ x 43′ 6″	Turbine 9,000 h.p. Machinery aft.	U.S.M.C.	10,780 ea. 14,500 ea.
Western Pipe & Steel Co.	3	C3-S-A4 Cargo Vessel 465′ x 69′ 6″ x 33′ 6″	Turbine 8,500 h.p.	Amer. Pres. Lines U.S.M.C	7,900 ea. 12,000 ea.
OREGON—					
Albina Engine & Machine Works, Portland, Oregon	4	Cargo Lumber C1-MT-BU1 301′ x 48′ x 26′ 3 cargo holds	Diesel 2,400 h.p. Twin screw.	U.S.M.C.	3,180 ea. 3,820 ea.
Kaiser Swan Island	3	Oil tanker 503′ x 68′ x 39′ 3″ 141,158 bbl. T2-SE-A1	Turbo-electric 7,240 h.p. Machinery aft.	U.S.M.C.	10,400 ea.
Oregon Shipbuilding Corp., Portland, Oregon	5	Cargo Vessel VC2-S-AP3 436′ 6″ x 62′ x 38′	Turbine 8,500 h.p.	U.S.M.C.	7,600 ea. 10,700 ea.
	2	Cargo Transport VC2-S-AP5 436′ 6″ x 62′ x 38′	Turbine 8,500 h.p.	U.S.M.C.	7,600 ea.
WASHINGTON—					
Kaiser Company Inc., Vancouver, Washington	3	C4-S-A3 Troop Transport 496′ x 71′ 6″ x 43′ 6″	Turbine 9,000 h.p. Machinery aft.	U.S.M.C.	11,300 ea.
Kaiser Company, Inc., Vancouver, Washington	8	C4-S-A4 Cargo Vessel 496′ x 71′ 6″ x 43′ 6″	Turbine 9,000 h.p. Machinery aft.	U.S.M.C.	10,780 ea. 14,500 ea.
Keels To Be Laid					
Consolidated Steel Corp., Wilmington, California	2	C2-S-B1 Cargo Vessel 435′ x 63′ x 40′ 6″	Turbine 6,000 h.p.	U.S.M.C.	6,200 ea.
Ships To Be Launched—On the Ways Up to October 16					
Albina, Portland, Oregon	2	C1-MT-BU1 Cargo Lumber Vessel 301′ x 48′ x 26′ 3 cargo holds	Diesel 2,400 h.p. Twin screw.	U.S.M.C.	3,180 ea. 3,820 ea.
Bethlehem-Alameda, Alameda, California	2	P2-SE-2R3 Pass. & Cargo 573′ x 75′ 6″ x 43′ 6″	Turbo-electric 20,500 h.p.		15,450 ea. 10,000 ea.

Consolidated Steel Corp., Wilmington, California	10	C2-S-B1 Cargo Vessel 435′ x 63′ x 40′ 6″	Turbine 6,000 h.p.	U.S.M.C.	6,200 ea. 5,000 ea.
Kaiser Swan Island, Portland, Oregon	2	T2-SE-A1 Oil Tanker 141,158 bbl. 503′ x 68′ x 39′ 3″	Turbo-electric 7,240 h.p. Machinery aft.		10,400 ea.
Kaiser Vancouver, Vancouver, Washington	6	C4-S-A4 Cargo Vessel 496′ x 71′ 6″ x 43′ 6″	Turbine 9,000 h.p Machinery aft.	U.S.M.C.	10,780 ea. 14,500 ea.
Oregon Shipbuilding Corp., Portland, Oregon	2	VC2-S-AP3 436′ 6″ x 62′ x 38′ Cargo Vessel	Turbine 8,500 h.p.	U.S.M.C.	7,600 ea. 10,700 ea.

SUPERVISOR OF SHIPBUILDING—U. S. NAVY DEPARTMENT

Contracts Under Construction, 12th Naval District, Pacific Coast

AS OF OCTOBER 1, 1945—PART I

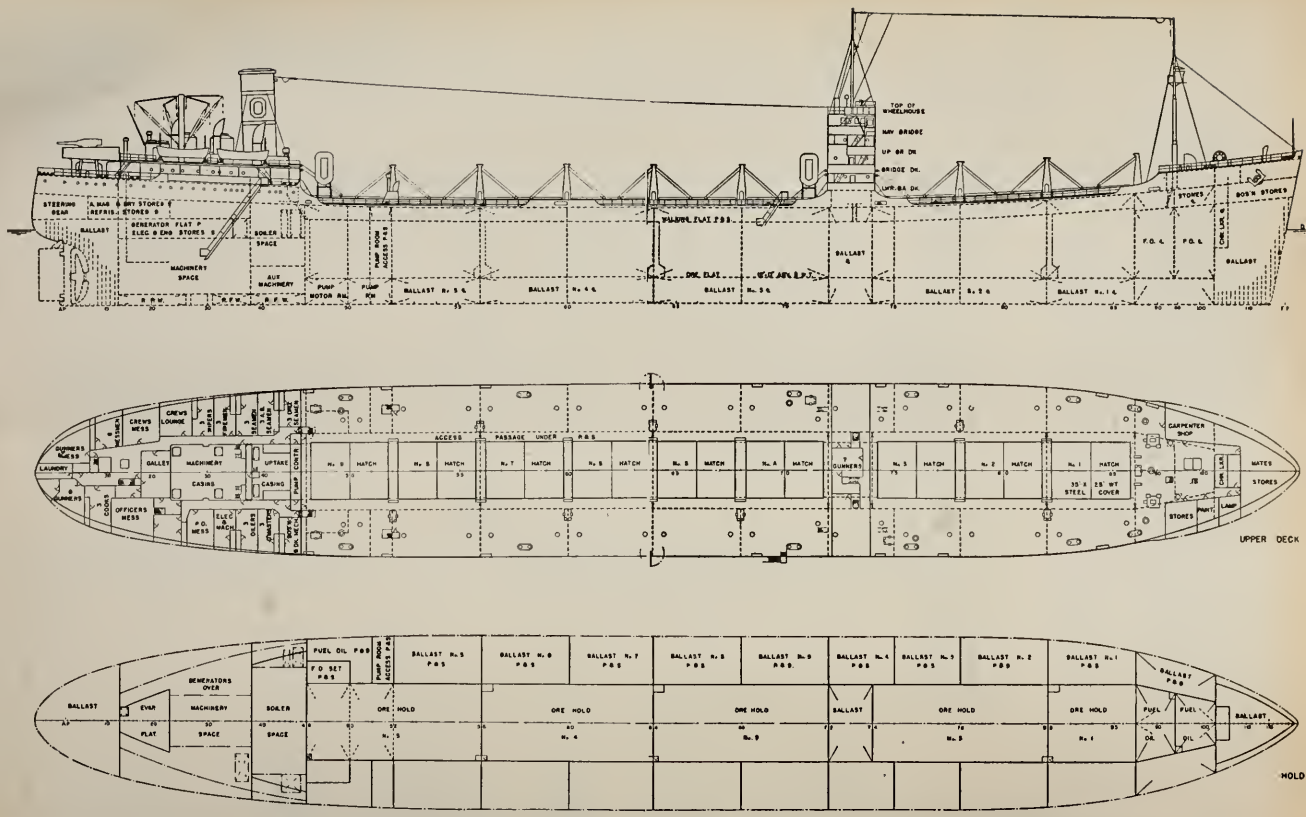
U. S. Navy Contract Summary

Contractor	Contract	Ships	Description	Program No.
Anderson & Cristofani	NObs-15059	C60161-60164 C74383-74388	64′ Victory Launches 64′ Victory Launches	113
Basalt Rock Co.	NObs-1403	ARS38-43 ARS44-49	Steel Salvage Vessels Steel Salvage Vessels	
Bethlehem Steel Co.	NObs-314 NObs-2156 NObs-1971	DD757-769 YCV15-18 YG45-55	2200 Ton Destroyers Aircraft Transportation Lighters Garbage Lighters	096
General Engineering & Drydock Co.	NObs-131	AM283-291	Minesweepers	047
Kneas, George	N220s-21945A N220s-28489A	(8 boats) (5 boats)	26′ Whale Boats 26′ Motor Whale Boats	113
Madden & Lewis	N220s-95521 MPO 3148-1 N220s-24778A MPO 3752-1	(6) (5)	Small Boats 40′ Motor Launches 26′ Motor Whale Boats	113
Moore Equipment	NObs-1828	YC1089-1092	Open Lighters	091
Pollock-Stockton	NObs-1505	APL23-26	Steel Barrack Ships	178
Stockton Coord.	N220s-90365 MPO-3150-1	(4)	Aircraft Fuel Boats 26′ Motor Whale Boats	

Extension by Name of Ship

Contractor	Ships	Name	Percentage of Completion	Priority	Delivery Dates
ANDERSON & CRISTOFANI					
NObs-15059 (10)	C60161-60164 C74383-74388	64′ Victory Launches		MM	6 delivered as of 9-30-45
BASALT ROCK CO.					
NObs-1403	ARS-41	Opportune	97.0	MM	10- 5-45
	42	Reclaimer	66.3	MM	11-29-45
	43	Recovery	57.2	MM	12-29-45
BETHLEHEM STEEL CO.					
NObs-314	DD-760	John W. Thomason	98.5	MM	10-11-45
	761	Buck	90.9	MM	12-15-45
	762	Henley	84.0	MM	2- 1-46
	763	William C. Lawe	79.7	MM	Undetermined
	764	Lloyd Thomas	75.2	MM	"
	765	Keppler	71.2	MM	"
	766	Landsdale	61.6	MM	"
	767	Seymour D. Owens	56.2	MM	"
	768	[illegible]	49.1	MM	"
	769	Abner Read	46.5	MM	"
NObs-1971	YG-45		97.8	MM	10- 5-45
	46		92.0	MM	10-19-45
	47		82.9	MM	10-25-45
	48		82.8	MM	11- 1-45
	49		69.1	MM	Undetermined

(Page Adv. 100, please)



Profile and General Arrangement of Upper Deck and Hold of Ore Carrier S. S. Venore.



S. S. Venore, Bethlehem high pressure steam ore carrier.

The New Bethlehem Ore Carriers

Embodying a number of new features in design and construction, the new ore carriers being built by Bethlehem Steel Company will present an important addition to the fleet of the Ore Steamship Corporation. They will be the largest and fastest ore carriers afloat; they will also have the highest pressure steam propulsion machinery installed and the highest power applied through a single screw in any cargo vessel in America, featuring the largest steam reheating marine installation ever built.

Present plans call for eight carriers, all to be built at the Bethlehem-Sparrows Point Shipyard. The first in the group, the S.S. Venore, was launched last January, placed in service in July, and has completed two round trips. Two more keels have been laid, with the next launching, the S.S. Chilore, scheduled early next year. The principal characteristics of the vessels are shown in the table herewith.

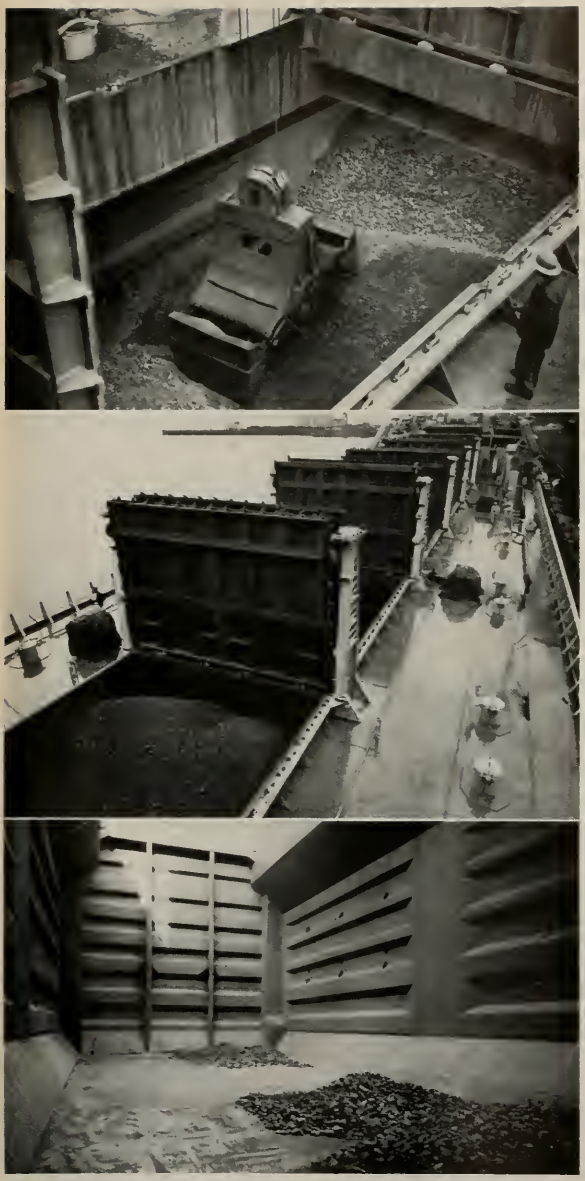
As shown in the illustrations, these ships are of the poop, bridge and forecastle type, with longitudinal framing throughout the hold space, and with transverses uniformly spaced at 10 feet. Transverse framing is employed in the bow and stern. Both longitudinal and transverse bulkheads are of the Bethlehem-Frear fluted construction.

Deck Gear

No cargo handling facilities have been provided, as all shore installations include loading and unloading equipment. Nine watertight steel

Principal Characteristics

Length over-all	583	feet
Length between perpendiculars	560	feet
Breadth, molded	78	feet
Depth, molded, to upper deck at side	43	feet, 9 in.
Summer draft, to bottom of keel	34	feet, 3 7/8 in.
Displacement in salt water	32,449	tons
Deadweight at summer draft	24,376	tons
Light weight of ship	8,200	tons
Capacity of ore holds	420,284	cu. ft.
Fuel oil capacity	13,613	barrels
Fresh water capacity	217	tons
Drinking water capacity	37	tons
Shaft horsepower, normal	11,000	
Shaft horsepower, maximum	13,000	
Designed sea speed	16	knots
Steam pressure	1,450	psi
Steam temperature	750°	F.
Cruising radius at 16 knots	12,000	nautical miles
Vacuum, main condenser	28½	inches Hg.
Steam for reheating	1,440	lbs.



hatches, each 35 ft. long and 25 ft. wide, are spaced at 40 ft. centers, with an additional 20 ft. between No. 3 and 4 hatches for the bridge. To facilitate unloading, the ore holds have not been recessed under the bridge. Each hatch cover is made of fluted plate, in two sections. These sections hinge fore and aft, and are swung up to the vertical position by wire rope tackle strung from king posts located at the hatch corners and operated by Clyde Iron Works steam winches.

As a safety measure two fore-and-aft passageways have been fitted below deck, in the upper outboard corner of the ore hold, to permit officers and crew to walk between the poop and the forecastle without exposing themselves to the weather. These passageways also carry all wiring and service piping running fore and aft, fully protecting them from damage by the sea. By taking advantage of the natural angle of repose of the ore, the passageways have been installed without sacrifice in the useful capacity of the holds.

24,000 Tons—2 Hours

The vessels will operate primarily in the U. S.-Chile and the U. S.-Venezuela trades, and loading will be done with the same equipment used on the other vessels operated by the Ore Steamship Corporation. The efficiency of this installation is illustrated by the fact that a record total of 22,600 tons of ore has been loaded in the short time of 28 min. This, however, was achieved with one of the older vessels. For the larger carriers of the S.S. Venore class, which must have some water ballast on board at the beginning of loading to permit lowering the loading spouts to the proper position, the normal loading time will be between 1½ and 2½ hours for 24,000 gross tons. Every means have been provided to expedite loading and discharging, and holds and hatches have been arranged to give a minimum of hand shoveling.

Unloading is done by means of grab buckets operated by bucket-unloading machines. Seventeen-ton

(Adv. page 92, please)

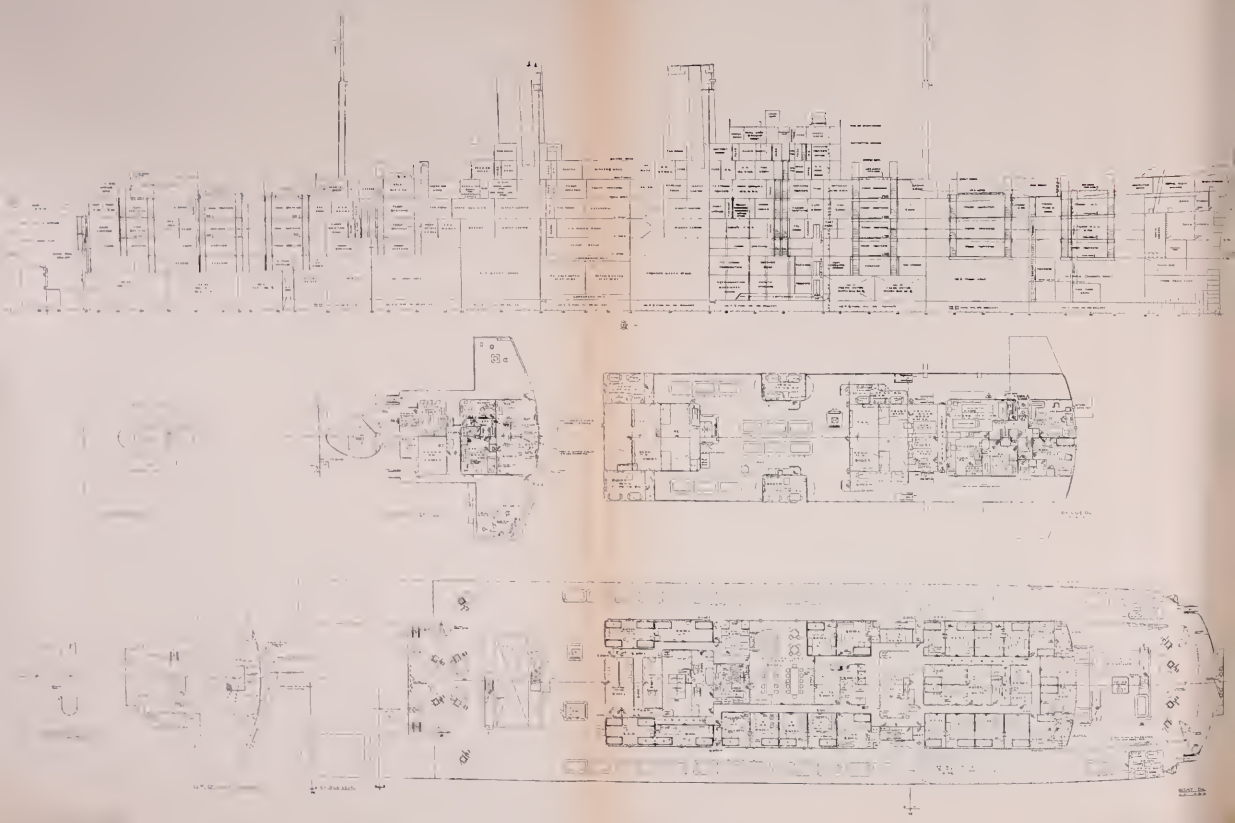
Top of page: Unloading S. S. Venore by grab bucket.

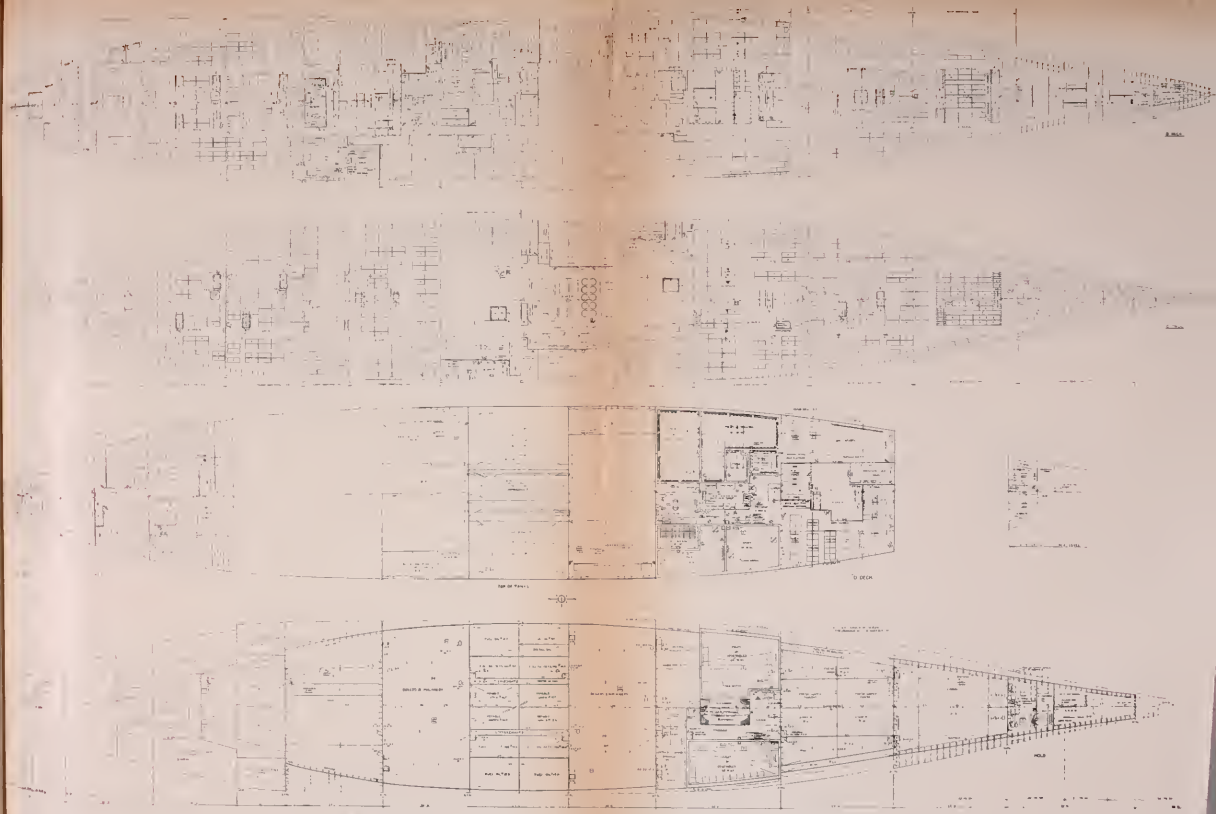
Center: Deck of the ship, showing king post arrangement and hatch handling mechanism.

Bottom: One of the ore holds, featuring Frear-Bethlehem fluted bulkheads.

LARGEST PACIFIC COAST BUILT VESSEL

Inboard profile and general arrangement plans of the P2-SE2-R1 Transport Type built at the Alameda, California, yard of Bethlehem.



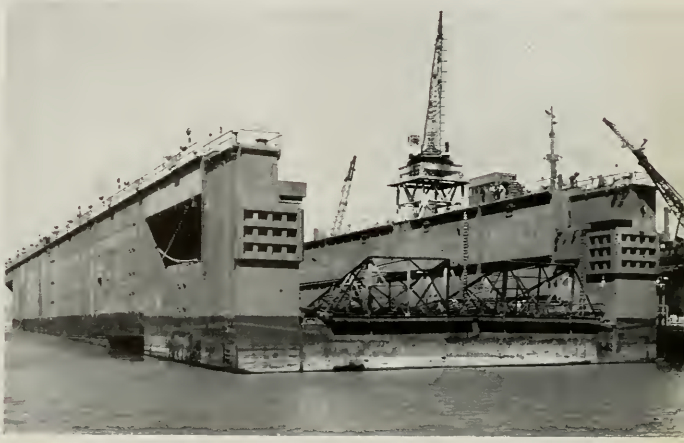


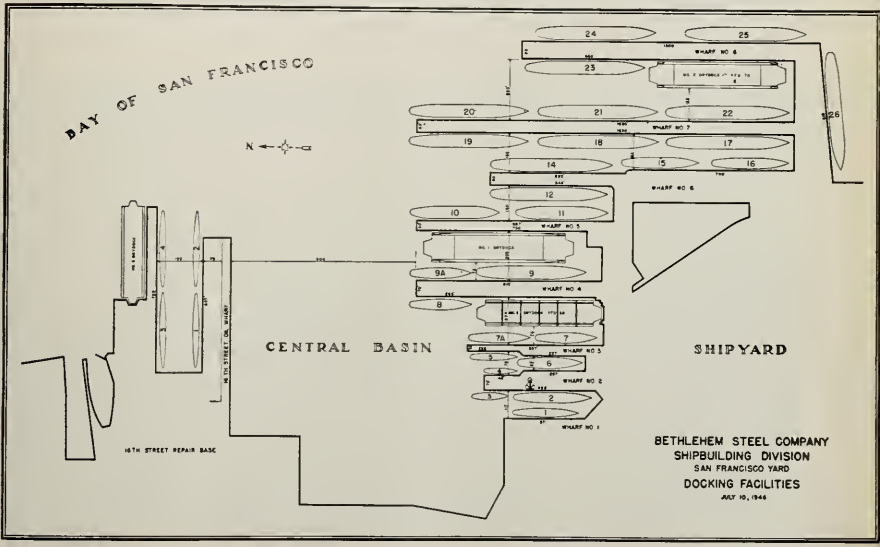
General Arrangement Plans at B, C and D Decks and the Hold at P2-SE2-R1

Over-all length 608 feet 11 inches, beam 75 feet 6 inches, draft loaded 29 feet. Shaft horsepower 18,000, steam turbo-electric drive. These vessels were fully described and illustrated in the October, 1944, issue of Pacific Marine Review. The last two vessels of this class are being built as passenger liners and will be delivered in the fall of 1946.

Largest Repair Yard

The San Francisco yard of Bethlehem (formerly Union Iron Works) now can claim to be the largest repair yard in drydock capacity and outfitting piers. With the advent of its latest floating dock, shown at right, and the completion of its latest finger pier, Whorf No. 8, as shown in the drowing, this plant can accommodate 27 seagoing vessels at its wharves, and has four large floating docks. With nearly 14,000 feet of berthing space, it can take care of over 2½ miles of ships undergoing repair, in addition to the faur drydacks.







Airplane view of Basalt Rock Company's yard on the Napa River. Note drydocks at extreme left.

Napa River Shipyard

Basalt Rock Company, Inc., Completing an Extensive Building Program of Deep-Sea Vessels

THE BASALT SHIPYARD, located on the east bank of the Napa River, 12 miles above the Mare Island Navy Yard, is a fully integrated shipyard completing an extensive shipbuilding program of seagoing vessels for the Navy. The facilities of the yard include four ship basins or drydocks, three having a length of 280 feet and the fourth being 450 feet in length, all served with trackage and crane ways, air, water and gas. The concrete sea wall, 1000 feet in length, serves as its outfitting dock, with a 50-ton American revolver crane being principal weight-handling equipment. The yard comprises some 39 acres completely paved with standard gage trackage and locomotive cranes and laid out for efficient handling of machinery and material. The Mold Loft, Flange Slab, Plate Shop, Forging Machine Shop, Pipe Shop, Sheet Metal Shop, Electric Shop, Woodworking and Shipwright's, as well as a Galvanizing Shop and Rigger's Loft, are all contained within the yard.

This yard was one of the first to receive the Navy Department Bureau of Ordnance Navy "E" for production award on the Pacific Coast in February of 1942, and subsequently was awarded the Army-Navy "E" which contains two stars.

The entrance of the Basalt Rock Company, Inc., into the shipbuilding business dates back to 1939, when they built a number of steel barges to carry rock, sand and gravel to supplement their fleet of wooden barges. In 1940 the yard was awarded contracts for various types of steel lighters and barges as a result of competitive bidding, and to date have built some 50 barges of various types, including 12 1000-ton seagoing cargo barges which were in use in the South Pacific prior to Pearl Harbor. The list of self-propelled seagoing vessels built by this yard is a commendable record of major shipbuilding construction: two 10,000-barrel YO type fuel oil tankers, dimensions 235 feet by 37 feet by 19.25 feet; 12 YF type yard freighters, 800 tons displacement, dimensions 132 feet by 30 feet by 12 feet; and 24 ARS type

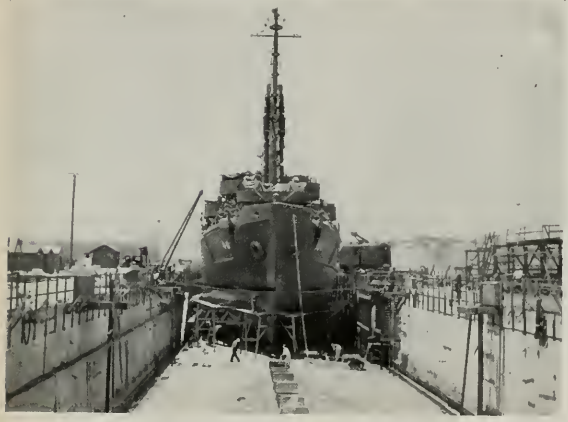


One of the ARS salvage vessels at Basalt Rock.

A couple of landing ships at the yard.









salvage vessels, 213 feet by 43 feet by 19 feet.

All of the above vessels were awarded either on competitive bidding or fixed price negotiated contracts, and built to the exacting specifications of the Navy.

In addition to the new construction program at this yard, they had entered the ship repair program shortly before the end of hostilities in the Pacific and completed the repair work on several auxiliary craft, including a complete overhauling of two LSM's. Repair of these two vessels entailed drydocking; removal of the port side of both vessels from the upper structure to the bilge and replacement after repairs were completed; thorough mechanical and electrical overhauling; rebuilding of 75% of the upper structure; complete overhaul of main engines, generators, pumps, propulsion, anchor-windlass; replacement of tail shaft and intermediates; repair and improvement of ventilation system; bow doors replaced; guns replaced and renewed; rigging overhaul; complete cleaning throughout and painting of the entire ship with hot plastic being applied to the hull.

At the present time outfitting is being completed on the last two ARS class Navy salvage vessels. Following this the yard will be available for shipbuilding and ship repair to serve the needs of the area. They have demonstrated from their record of shipbuilding accomplishment that they are able to take their place as one of the experienced shipbuilding and repair yards in the Bay Area.

The officers of Basalt Rock Company, Inc., are: Albert G. Streblow, president; Walter Fawcett, vice president; E. F. Brovelli, secretary-treasurer. Together with Follett Morris and John Cassaretto, they comprise the board of directors. Louis Cassayre is superintendent of the shipyard.

Top of page: U. S. Navy Coaster motorship. ARS salvage vessel in background.

Center: A salvage vessel in drydock.

Bottom: A corner of the Machine Shop.

European Diesel Design Progress

In 1942 an article was published in **Pacific Marine Review** describing the experimental work of Sulzer Bros., Winterthur, Switzerland, in connection with the supercharging of two-cycle diesel engines and the further development of the Sulzer internal combustion engine up to the gas turbine. This work has continued and expanded and the present article brings it up to date.

In the field of the non-supercharged high-powered marine engine Sulzer Brothers have completed the standardization of their various types begun before the war. The project called for a standard design for elements which previously differed for almost every engine type (pistons, cylinder covers, bedplates, connecting rods and bearings, fuel injection pumps, starting devices, governing apparatus, and other items) so that these could be reduced to a small number of standard forms. The parts in question can now be used interchangeably for different sizes and numbers of cylinders and as far as possible for different categories of engine (stationary and marine), which greatly facilitates their manufacture and stocking. It was possible at the same time to improve designs and to increase their reliability, as practically every constructional element had already been tried out for years in exactly the same design on some earlier Sulzer engine.

High Supercharged Marine Diesels

A high-supercharged two-stroke opposed-piston marine engine has for some time been on the testbed and has now completed the first part of its trials. The particulars of the engine are as follows: 6 cylinders of 12½" bore and 2 x 15¾" stroke; supercharging pressure 28 lbs./sq. in. abs. m.e.p. 152 lbs./sq. in., 4000 B.H.P. at 440 rpm crankshaft speed and 110 rpm propeller shaft speed. For the first tests the scavenging pumps were retained and a supercharging set consisting of exhaust-gas turbine and axial compressor was also used, as pre-compressor set for the pumps. The delivery pressure of the axial compressor reaches full supercharging pressure at full load, but decreases correspondingly at part load. Reversing the engine is simple, as no special measures need be taken to prevent the blower from being reversed too. A series of trials has confirmed expectations regarding power and efficiency: a fuel consumption of .361 lbs. per B.H.P. hour was obtained at the first trials.

The next step will be made with the equipment the engine is finally destined to have, i.e., with piston-type super-charging pumps, without the axial compressor, and with an exhaust-gas turbine mechanically coupled to the engine through a hydraulic coupling. During reversing operations the exhaust-gas turbine is cut out, the engine developing 65 per cent of its full output when running astern without turbine power. The second series of trials with this form of equipment will begin this fall With regard to space requirements a high-supercharged engine of this design offers definite advantages over conventional present-day solutions. It is as short as a double-acting engine of the same power, no broader than a corresponding single-acting engine and lower than the engine of an equally powerful geared plant. Its weight is lower than that of any other type of high-powered marine diesel plant, attaining with reduction gearing and thrust bearing a figure of only 39.5 lbs. per shaft hp, which is less even than with existing high speed diesel electric drives, in spite of the sturdy design typical of the more conventional Sulzer marine engines.

A high-supercharged opposed-piston two-stroke engine has been submitted to thorough trials on the testbed. This engine has six cylinders of 7.1" bore and 2 x 8.85" stroke, supercharging pressure 28 psi abs., m.e.p. 171 psi, 850 rpm, 1560 BHP. hourly rating, weight 17 lbs./BHP. A similar engine has been built in extra lightweight welded steel design. This 8-cylinder unit, of the same bore and stroke as above, with a supercharging pressure of 35 lbs./sq. in. abs. giving a b.m.e.p. of 200 psi at 1000 rpm and 2850 BHP. one hour rating will be ready for the testbed at the end of the current year. Its weight will reach the remarkably low figure of 7 lbs./BHP. (hour rating).

A Sulzer free-piston power-gas plant is also running on the testbed. It comprises 3 free-piston power gas units of 15¾" bore with stroke adjustable from 2 x 23½" to 2 x 26", 350 cycles per min., m.e.p. 225-285 lbs./sq. in., 7000 BHP. total output, a precompressor set (consisting of auxiliary turbine and precompressor) and a power-gas turbine. The electric generator is replaced for the time being by a water brake so that the whole plant can be tried out both as a stationary power plant with constant generator speed and as a marine plant loaded according to the propeller law. This plant will shortly commence the main and continuous trials of a comprehensive program, to three power-gas producers having already been tested individually and in combination. Numerous U. S. technicians have seen this plant at the Sulzer works these past few months.

The trial plant of such a marine turbine to give an effective output of 7000 S.H.P. is at present under construction.

The character of these new combustion engines and the features of their service in some cases make necessary the application of a variable pitch propeller. This offers: the absence of reversing gear; the reduction in size of the starting-air plant; the elimination of the thermally injurious effects of reversing with compressed air; the possibility of maneuvering from the bridge; and the free choice of engine speed within certain limits. These considerations led Sulzer Brothers to study the problem of the variable pitch propeller and to submit it to practical tests. For this purpose a vessel has been equipped with a variable pitch propeller of Sulzer design and has now been in regular service for some months.

Steam Power

Steam power developments at the Sulzer works are being prosecuted

(Page 692, please)

Keep Posted!

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Fire Repellant

A new Underwriters' approved paint which protects wood and other materials against fire hazard is announced by the General Detroit Corp., Detroit, Mich., and the General Pacific Corp., Los Angeles, Calif. Called Fi-Repel, it is endorsed by Underwriters' Laboratories and other leading testing bureaus for protection of all interior combustible surfaces.

Made for use in factories, warehouses, hangars, garages, schools, hospitals, hotels, homes, and wherever else fire protection is necessary, it is shipped as a concentrated paste. After dilution it can be applied with a brush or spray gun to the surface to be protected. One concentrated gallon, at standard dilution, will cover as much as 185 square feet with two coats. Standard color is bone-white, but tints may be easily added.

In a recent test made by the Portland, Oregon, Fire Department, two identical wood structures were subjected to fires of burning oil. One, painted with Fi-Repel, suffered only minor charring, while the untreated one burned to the ground in less than 25 minutes.

The illustration shows an ordinary physician's tongue depressor, one end of which is painted with Fi-Repel. The unpainted end burns freely, but the flame dies when it reaches the painted portion.



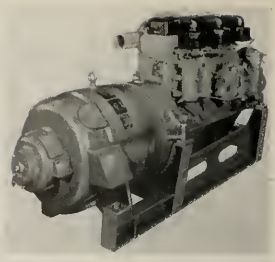
Control of Corrosion

Positive control of corrosion by air drying plastic coatings is now possible. Exterior coating films have been developed which are unaffected by exposure to petroleum products or vapors, dilute mineral acids or alkalis, such as hydrogen sulphide, sea water, salt in air or solution, oxidizing agents as nitric or chromic acids; are non-conductors and, therefore, prevent electrolytic corrosion; have a high degree of ductility, excellent abrasion resistance; being fireproof, they will not support combustion; effectively prevent corrosion for long periods; are applied in same manner as paints and fall in the same price range. Interior coatings have the same characteristics and remain unaffected by crude oils, gasoline, distillates and other fractions of lower than 30 per cent aromatic content. Different coatings are specifically recommended for various corrosion problems. Suggested applications are: barge, storage tank, pipe lines, and equipment exteriors; storage tank, tank car and drum linings. These coatings are distributed by Oil Trading Company, New York, N. Y.

A Compact Diesel Generating Set

Two generating sets made by Bardco Manufacturing and Sales Co., Los Angeles, were installed in the Dragich Brothers' 88-foot purse seiner Sea Scout, built at Harbor Boat Building Co., Los Angeles, Calif.

The two power generating units each consist of Bardco 40 kw, 120-208 volt, 3 phase, 60 cycle generators with built-in exciters driven by Superior 6-cylinder diesel engines fully equipped for marine service, including heat exchangers. The generators will supply power for all-around requirements on the boat, including drive for auxiliary equipment, winch



operation and tuna refrigeration. Hold capacity of the vessel is stated to be 200 tons of sardines or 140 tons of refrigerated tuna. Propulsion is supplied by a 400-hp, 6-cylinder Enterprise diesel engine.

Selection of the Bardco ac generating sets was made to obtain smaller, lighter generators and motors and more compact installation, as well as to secure greater use of standard electrical equipment and appliances throughout the boat.

The Sea Scout, now operating in coastal waters, is a sister ship of the City of San Pedro, the first post-war boat to be completed in the Harbor Boat Building Co. yards.

Asidbar Wood

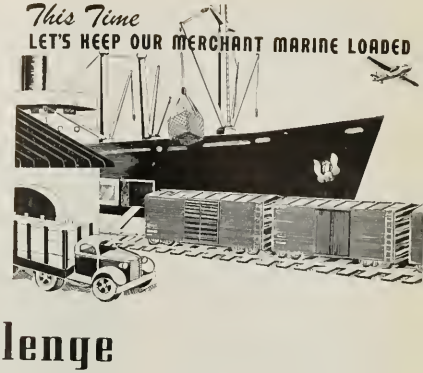
Structures exposed to rapid deterioration by contact with acid solutions or fumes can be made acid-resistant through use of Asidbar, a plastic-impregnated wood developed by Koppers Wood Preserving Technical Department, Orrville, Ohio.

In one application in a spray type pickling machine, Southern Yellow Pine guides treated by this process are subjected to a 10 per cent to 15 per cent sulfuric acid at temperatures of 180° F. The acid resistant wood is sound and firm after 18 months' service. Untreated wood in this same application lasted only two to three weeks. Fume ducts exhausting the acid fumes from the same machine were built of acid resistant treated wood, and have given similar service. Metallic alloy flues lasted only a short time. Untreated wood fell apart in these ducts after two weeks' exposure.

Asidbar may prove useful in many applications on board ship, such as decking and treads in locations subject to rough use or to decay.

(Section continued on page 675)

Pacific WORLD TRADE
Reg. U. S. Pat. Off.



By T. Douglas MacMullen

A Challenge

In a recent address before the San Francisco Chamber of Commerce and the San Francisco Commercial Club, Eugene E. Wilson, president of Aircraft Industries Association of America, offered a challenge.

After reciting the obstacles which his industry had faced and overcome during its infancy—obstacles of the depression, of the air mail contract cancellations and of approaching war restrictions by the Government, and the industry's final emergence as an overwhelming instrument of victory, Mr. Wilson concluded:

"Today we in the aircraft industry hand you a new instrument and with it we hand you a challenge. Look out through Golden Gate beyond the setting sun and you will see prospects more glittering than any the world has yet seen. With these new Argosies of Air Power you can create new trade, new industries, new jobs, new security, and peace.

"There are obstacles, plenty of them, but none greater than those faced by Yankee traders in Yankee clippers who breached artificial barriers to create the China trade. Here is a challenge to reassert the superiority of the way of freedom and the spirit of our Western pioneers, and to create a lasting peace—the Pax Aeronautica."

This challenge was offered to the business public as a whole. But is it not one for the maritime industry to take up? How about the argosies of ships and the industries—even the cities—and the prosperity created by them?

Is there a spokesman in the Chambers of Commerce or elsewhere who will tell the public and the world of our trading future and who will help to lessen the obstacles and the inertia that permit our port cities and the dependent back country to lose, through Government shortsightedness and slowness, the employment and trade which the maritime industry has struggled and is struggling to create and maintain?

We hail the aviation industry for its accomplishments, for its ingenuity, for its foresight, for its public relations which have enabled it to win for a new and complex industry a degree of support from the sluggish civic bodies which the maritime groups are unable to get.

Why, for instance, is there no concerted **demand** by coast city governments for sea-air service—a service wanted by the public and of major if not vital importance to the steamship industry?

Why is there no **demand** from the traffic associations and the other commercial interests for coastwise freight rates that will permit ships to operate?

Why is there no **demand** for an OPA price provision that will not take away the reasonable incentive for intercoastal water traffic?

Why is there no **demand** for decent conveniences — transportation and otherwise—for steamer passengers?

Why is there no **demand** on the part of industry, labor and the general public for protection for the employment, financial and trading future which is encompassed by the all-important shipping industry?

Let's accept the challenge.

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"The Pacific Is No Longer an Ocean Barrier, but a Highway to Commerce, Trade and Finance."
—Capt. Edward C. Holden, Jr., USNR, Master of S. S. Admiral W. S. Sims.

Where Do We Go From Here?

Basil Harris Has Sound Proposals

Using the sounding board of the Propeller Club's Annual Convention in New York on October 19, Basil Harris, president of the United States Lines, made six proposals for the general welfare of the industry. All of them are good.

Mr. Harris is perhaps the industry's leading advocate of improved port facilities throughout the country, and his additional objectives will be widely adopted.—Ed.



Basil Harris

We now stand on the threshold of a new era, and it behooves us to take an accounting of our position and to lay our course of action for the future, and at this point we may well ask ourselves—"Where do we go from here?"

If we determine to make a trip abroad, we make our plans—we arrange our schedule — we plan our finances. The builder who contemplates a new structure secures his site, carefully goes over his plans with his architect, and then lays out his schedule of work. We are in somewhat a like position wherein it is imperative that we look ahead to our future plans and what requirements are needed by the shipping industry to steer a safe and true course in the turbulent waters ahead.

I have attempted to codify these requirements into a series of "musts," or perhaps "demands" is a better word, which might well be termed a Bill of Rights founded on past experience and future hope and well-being for the industry—for, as the shipping industry prospers, so will our own country prosper. We must think clearly, we must talk clearly, we must act clearly and boldly, and we must take the leadership in the course which we think will be best for the industry and best for the nation.

First: We demand representation in the Cabinet of the President of the United States. To be known as the Secretary of Transportation.

The truck, the train, the plane and the ship play such an important part in our daily life and are such an integral part of our economic structure as to merit primary attention by the Cabinet of the President. Every man, woman and child in this great nation—whether it be the food we eat, the places we go, or the work we do — is directly dependent on transportation in one form or another, and much of this transportation is competitive, so regulation is essential. Therefore we need a spokesman who can sit in the seats of the mighty and speak for all forms of transportation with the dignity and authority of a Cabinet minister. It is a self-evident fact and needs no defense.

Second: That the Maritime Commission be removed from politics.

The importance of shipping in our national economy, and the very safety of our nation itself, demands that the Commissioners be selected on a merit basis. The same care should be exercised as is shown in the selection of a Justice of the United States Supreme Court. We want no plumbers, no electricians, and no paperhangers on this Commission. They may be tops in their own field, but not here. This is a highly technical field and the choice demands the greatest and soundest care. The Lord must have known our needs when He gave us two such men as Admiral Land and Admiral Vickery to lead us through our shipping difficulties, but lightning doesn't strike twice in the same place, so let us depend not on chance but on judgment.

Third: We demand, and we have a right to demand, greater support and more cooperation from the individual States and Cities of the Union.

The ports of our seaboard states are as important to the welfare of the peoples of those states and the interior states as are the pores of the body in the survival of man. Everything for our health, wealth and happiness moves in and out of our ports. We therefore need and expect the support of every citizen, and especially the chosen servants of the people—our legislators. Where would Louisiana be without New Orleans, and where would Massachusetts be without Boston? Every citizen of New York State has a most important stake in the port of New York. In return we ask not only his or her financial support, but, more important, his or her sympathetic support and understanding of the importance of this great port in the economic, social and cultural life of the state and of the nation.

Fourth: An intelligently planned and broadly laid out policy of public works.

Practically every foreign port of

Pacific World Trade

ally and enemy alike has been destroyed during the war. Each will be rebuilt according to the most modern of plans and equipment. That will be our competition and we must face it.

Port modernization and improvement—well conceived and executed arterial highways and the elimination of bottle necks to trade and travel, new piers and new approaches where needed, better cargo handling methods, etc. This can be the only answer to foreign competition, and it can't be done with obsolete port facilities—some a hundred years or more old.

The Federal Government should correlate the needs and future plans of the various states and especially the seaboard ports so that in times of depression and unemployment a well conceived and broadly laid out plan might be put into effect which would dispense with selling apples and raking leaves, but rather would bring about useful and productive employment. Such projects over a period of years would be self-liquidating.

Fifth: Revision of the Tariff. This is somewhat like the weather—a great deal of talk but nothing is ever done about it.

Trade is a two-way street. To export, and that is 10 per cent of our national economy—in other words, one job in every ten is dependent on it—to export we cannot at the same time build a Chinese wall around ourselves and say, "Take our goods but don't bring your goods into this country." Too long has the Tariff been the tool and whim of self-seeking and selfish blocs whose policy has been, "Let us sell, but don't make us receive." Reciprocal trade treaties have proven the death knell of the bugaboo about the Tariff, and what now is needed is more intelligent, unselfish and enlightened thinking, not for the favored few, but for the good of the whole. With American ships carrying 50 per cent of our import and export trade, American merchants can be reassured of fair treatment on the seas.

Sixth: Labor and Management. In the period of readjustment and beyond, it is essential that labor and management get into harness and each pull its fair share if we are to get ahead. We learned to do it in the war years, we must do it in the peace years! We see each other a lot more clearly than we did, and we both realize we are interdependent one on the other.

Labor and management are like two keys to a lock box; neither one can attain its goal singly, and yet if the two are adjusted to each other, success is attained.

For the first time ship operators the country over are united under one tent. The same is true of the seagoing personnel. Each has its separate meeetings periodically but no effort is made to get together jointly until the working agreement is within a few days of termination, whereupon frantic efforts are made to adjust differences and to iron out kinks which have been in formation over a twelve-month period. That's silly and is bound to lead to trouble and misunderstanding. I, therefore, suggest and urge that ship operators and leaders of the various unions have stated intervals of meetings, say one every two or three months. Let an agenda be prepared, a list of complaints and working conditions be submitted to a labor-management panel for joint and prompt action. In this way we can make a start towards trusting one another and sinking our selfish interests. What we need is a little less name-calling and a whole lot more faith and understanding, for by faith and understanding not only can mountains be moved, but perils of the sea, in the sea and on the sea, be removed. United we can go forward to smooth water and clear weather. Divided we will ever run into stormy weather!

Good Neighbor Brazil

Talking about the Good Neighbor Policy and doing something about it are two different things. But when Captain Mario Celestino, Brazil's top shipping executive, discusses the subject, he means business.

Captain Celestino and his country not only believe that "trade between the United States and South American countries will be greatly increased" but they already are preparing for it.

As president of the Brazilian Merchant Marine Commission and director of Brazil's nationally-owned Lloyd Brasileiro steamship lines, Captain Celestino recently placed a $37,000,000 contract for 14 streamlined cargo vessels with the Ingalls Shipbuilding Corporation.

That in itself set a precedent for trade between our country and South America, for it was the first large order ever given a U. S. shipyard by a South American country. Brazil plans to operate the ships, along with six identical ones being built in Canada, between South American ports and New York and New Orleans. They will transport coffee and vegetable oils on the run north and return



Cotton awaiting shipment on a Sao Paulo dock.

with cargoes of manufactured products.

However, when Captain Celestino discussed the possibilities of increased trade during a recent inspection tour of the Ingalls yard, he didn't confine himself to the trade relationship of just Brazil and the United States. He pointed out a

Pacific WORLD TRADE



San Francisco? New York? No, a street scene in Sao Paulo, Brazil.

number of facts which apply to all South American countries.

He referred to the increased opportunities for establishing permanent markets of mutual benefit, better transportation and shipping facilities, trade agreements and more sensible credit understandings.

Pointing out that most European nations would not be in a position for years to supply South American markets, Captain Celestino cited the large Brazilian trade which Germany was able to build up before the war through exchange of goods.

Germany would buy products from Brazil and offer such favorable credit and exchange terms that Brazil was practically forced to take payment in manufactured items from Germany. That is changed now, he added, not only because Germany is

The shaded Avenida Rio Branco, Rio de Janeiro.





Belt conveyors loading coffee into steamer, Santos, Brazil.

not in a position to supply the goods but because financial arrangements with the United States are being gradually established on a more favorable basis.

Carrying this point further, he said that even wealthy Brazilian companies had been accustomed to being required to pay "cash in New York" before any goods could be shipped to them. Now, with more sensible credit understandings and with the help of the Import-Export Bank, these bars are wisely being let down.

Another development which might be credited generally to the United States efforts under the Good Neighbor Policy is "the better understanding of South Americans as customers." Captain Celestino said that Brazilians, for example, do not like high-pressure selling, and Americans are learning to treat them as they do other customers—first finding out what they want and then trying to fill the bill. This understanding might be traced to a certain extent to the fact that more and more Brazilians are being sent to this country for technical training, all of which helps people to understand one another better.

As for transportation and shipping facilities, Captain Celestino has no doubt that they will be much better than they were before the war. It was sometimes easier then for South Americans to go to New York via London on account of more frequent sailings of British ships.

Docks at Recife, Brazil.



The fleet of 20 Brazilian ships, recently ordered, is expected to take an important part in providing modern shipping facilities between South American ports and New Orleans and New York. With a total full load displacement of 12,000 tons (deadweight, 7500 tons), the ships will have a designed speed of 16 knots (trial speed, 17½ knots).

The ships are replacements for some of the 26 which Brazil lost to torpedoes, mines, etc., during the war, a fact which is not too well known in the United States. Fourteen hundred men went down with those ships, Captain Celestino said, and Brazil sent 30,000 men to fight in the Italian campaign.

Some high United States officials have pointed out, he added, that "Brazil, within her means, was our best ally."

Tankers Released

The War Shipping Administration has issued an order for the return to their American owners of all tankers of more than 3000 gross tons in accordance with a decision reached at the recent Washington meeting of the United Maritime Executive Board, which governs the United Nations shipping pool.

The order took effect at midnight October 31, 1945, and affects about 300 tankers owned by American citizens under American or foreign registry or owned by any wholly-owned foreign subsidiary of American citizens now under time charter requisition or bareboat charter to the WSA and which are declared surplus to the operating needs of the Government.

The report of a survey made by the tanker sub-committee of the United Maritime Executive Board, on which the WSA acted, showed that more than sufficient tanker transportation became available during October and will continue to be available thereafter to take care of estimated world-wide tanker transportation requirements. The review also disclosed that the United States is in a position, pending passage of ship disposal legislation now before Congress, to make tankers available to all nations to give their fleets equitable opportunity to engage in commercial trades.

China's Steel Industry

By Henrik Ovesen

I have recently returned from a trip to China as chief engineer for the Nelson Mission. In connection with this service I have been through all the steelworks in Free China and have also visited several of the larger machine shops. The object of the trip was to diagnose the troubles with the Chinese steel industry and endeavor to set it in motion.

The mission worked under the general direction of Dr. Wong, Wen-Hao, the minister of economic affairs, who had delegated very able Chinese industrialists to take chairmanships of the various committees formed under the newly created Chinese WPB. Such men were Y. C. Sun for coal and coke, C. S. Wang for ore, F. Chen and M. S. Pai for power. Meetings were held and discussions took place covering all steps leading to increased production and improvements which could be made quickly and without importations from abroad.

It must be remembered that the part of China which is now Free China is poor in so far as means of communication is concerned, and, worse than this, the quality of raw materials for steelmaking is not all that could be desired. The Chinese decided in 1936 to move their arsenals to the vicinity of Chungking and in this moving they have performed unbelievable feats. For example, they have taken a boiler and a 2500-kw turbogenerator apart, loaded them on river craft, shipped them 1500 miles up the Yangtsekiang, and re-erected them without missing a part! They have built several small blast furnaces, 25 to 30 tons' capacity per 24 hours, and also Bessemers of 2 tons' capacity and a few open hearths of 10 tons' capacity, all feeding steel to small rolling mills. Most of the furnaces have been built of plate salvaged from river steamers, and the boilers from steamers are in evidence everywhere. The mills can probably produce 50,000 tons per year if operated to full capacity.

Chinese machine shops are generally equipped with German machine tools of light design, and, in the arsenals, specialized to the limit.

In absence of automatic screw machines they use light lathes with hand feed and generally operated by an apprentice boy who gains remarkable skill in his repetitive work.

There is great reluctance to work 24 hours. This is blamed on inability to get men, but it is probably more an old Chinese custom to be at home at night which is the reason.

We did not see any machine shops working the night shift. The private machine shops seem to be in hands of energetic managers or owners. The largest is the Ming-Sung Engineering Works headed by Mr. Lu Tso-Fu. This plant has machine tools for large and heavy work and is connected with a shipyard. Some American machine tools were found here, although most of them were rather old.



Machine tool design in the China cottage industries.

In Kunming is another large machine shop set up by the N.R.C. It is a rather complete establishment having an iron and steel foundry, boiler shop, electrical shop, and a machine shop with fair equipment.

The government through an agency, N.R.C., National Resources Commission, owns the greater part of the steelworks, an up-to-date refractories plant, and some machine shops. The government also owns all the arsenals, and the War Ministry and N.R.C. each owns one half of the largest, Ta-Tu-Kuo, which has a 100-ton and a 30-ton blast furnace, two 10-ton open hearths, a Bessemer, two electric furnaces, a 2.5-meter plate mill, and a structural mill.

Government ownership is not better liked in China than in the United

CHINESE FORGE

In the "cottage industries" of China much of the steel industry of the country has found its development.





Mounds of old clay crucibles. This plant has been in operation for 2000 years.

States, and it is not as efficient as the private companies.

Besides the 25-ton blast furnaces at the steelworks there are, in the Province of Szechuan, several hundred of 1-ton charcoal blast furnaces operated by the farmers during the

Old Chinese wire-drawing equipment.



period of the year when the farm does not require attention. These "native" producers deliver about 1 ton per 24 hours and this iron is very pure. It can be produced for about one half the cost of the steelworks pig iron and is therefore easily disposed of.

The question was raised several times by the Chinese managers and owners: What to do with Chungking's steel industry after the war? The answer could only be an evasive one: Can you compete with a plant in Hankow or Shanghai? It is our belief one of the privately owned works may remain but the bulk of steel can be imported at a lower cost than the district can meet. In other words, this industry is purely a temporary expedient. Even should there be a market here in coming years, the plants are all built so it will be difficult to expand, owing to the terrain and to the fact that the men locating the plants evidently never thought that expansion might be desirable.

All transportation today is based on the rivers, and with a difference between high-water season and low-water season of close to 90 ft. the harbor question alone offers difficulties. Today all material—ore, coke, coal, stone, etc.—is carried by coolies up these banks and the finished material is carried down them; but this must also be changed to cut down expenses.

Last but not least it must be remembered that practically all of the executives and many of the skilled men are refugees, and inasmuch as not only materials and works but living conditions too are better where they came from, they will probably move back when occupied China is freed again.

As an emergency the Chinese have performed a commendable piece of work, but the central, northern, and eastern sections of China will reap the benefit of the experience gained in the refugee regions.

The arsenals will probably remain here for safety's sake. It is my opinion it will take many years to get China industrialized if the United States or others do not step in and build and partly man steelworks, foundries, and machine shops, until the Chinese have developed a number of foremen who can carry on. The lack of these seems to be the greatest drawback in the works today. After the war there should be a tremendous market for modern machine tools, cement plants, and woodworking machinery, and it may well be possible to dispose of our used machine tools, thus enabling the makers to take used tools in trade-ins for

new designs of tools to be sold to American machine shops.

There should also be a big market for modern road-building machinery as the immense hinterland is poorly provided with highways and the existing ones are none too good.

If a low-cost engine can be developed for the river junks loading from 40 to 60 tons, it will be in demand, as labor in China is not cheap any more and these junks require from 10 to 16 men. Waterways will always play a large role in the country's transportation system. There will be a demand for some railroads too, but the cost of building railroads in the western provinces is high because of the terrain.

There is much to do in China and some of the people are aware of it. Hundreds of Chinese are in the United States now and more are coming to study our methods in industry.



Driving piles by hand.

In comparison with the preceding pictures, here is a unit of Bethlehem Steel Company's South San Francisco Plant. Twenty-four-inch and 18-inch rolling mills.



Marine Aspects of the Oil Problem

FUTURE FOREIGN REQUIREMENTS

By Gordon Michler
Standard Oil Co. of N. J.

I understand that this meeting is largely interested in the post-war trend of demand for crude oil and finished petroleum products, upon which will largely depend the amount of seagoing transportation required of our merchant marine and that of other nations. The greatest part of this transportation will, of course, be effected in tankers moving major petroleum products and crude in bulk. A demand will continue to exist for movement by cargo vessels of lubricating oils and other special products in packages. The extent to which this latter demand will be maintained depends largely upon the increase in consumption for these products in foreign markets, as the tendency in European and Latin American countries is to follow the lead of the United States in handling petroleum products economically on a bulk basis and progressively reducing handling, and hence transportation, of packaged goods.

I am sure that it must be understood by everyone here that any estimates made at the present time must of necessity be due for a considerable amount of alteration in future, dependent upon various factors, including the rate of rehabilitation of European countries and of reconversion both abroad and here to a peacetime economy in industrial operations. The best estimates made under present conditions are still in the realm of guesswork. However, I will try to do the best I can, from information collected from responsible sources in the oil industry, to attempt to give some estimate of the demand for petroleum supplies in the years immediately ahead of us, with an even wider guess for future years up to 1965, the latter merely to indicate our best available perspective on future trends. This is on the assumption that you gentlemen representing the American Merchant Marine Institute are primarily interested in the amount of seagoing transportation that will be needed and can be kept occupied in carrying the petroleum products to meet these demands. In referring to petroleum products, we mean both crude oil and refined products. Presumably there is no difference from your standpoint, as both require transportation by seagoing vessels.

As a basis for these estimates, we have had to assume certain basic hypotheses, now that the war in both hemispheres has fortunately terminated, and efforts are being made by government authorities and the petroleum industry in many countries to restore the handling of petroleum products to a commercial basis. This of course involves the unscrambling, so to speak, of the controlled agencies and methods that were necessary for the wartime supply of these products to fighting fronts and on a greatly reduced basis to the civilian necessities of the various consuming countries. It is fair to assume that to a large extent this will have been accomplished by the end of this year. Unfortunately what will take longer is the rehabilitation of machinery, industrial equipment, transportation systems, and other consumers of oil in many countries affected by the war. For the purpose of these rough estimates, we are assuming the following:

(1) Political and economic conditions will become reasonably stabilized next year, and will progressively improve at satisfactory rates, at least through 1950.

(2) Russia will be largely self-sufficient.

(3) European and Far Eastern refineries in countries where war damages have been sustained will be operating at maximum estimated rates by 1947. In other areas, refinery operations will generally be based on existing and projected capacities. By 1950 it is assumed that considerably greater refinery capacity will be available in all areas as a result of reconstruction of damaged plants and construction of new refineries.

(4) Supply and demand conditions within the United States will cause this country to progressively reduce exports and to become a net importer of petroleum in the post-war years.

(5) There will be no shortage of tankers. One aspect of this question, the amount of tanker tonnage that will be available to meet the requirements I am going to refer to, is something that you gentlemen are in a position to judge for yourselves. Presumably your immediate concern is whether the demand for petroleum transportation is going to pick up at sufficient speed in the next few years to absorb the amount of tanker transportation available, including construction effected during the war.

The following discussion is subdivided into two sections—namely, the short-term period 1947 to 1950, and the long-term period 1950 to 1960 and 1965.

In the short-term period, the forecasts of foreign petroleum demand are based upon available data of the principal requirements, country by country, of the markets of the Western Hemisphere, excluding the United States; and of the Eastern Hemisphere, specifically Europe, excluding Russia. The sum total of these requirements should give some indication of the amount of demand that will exist for petroleum transportation by tankers and other vessels.

Total crude and product demand in all foreign areas outside the U. S. in 1947 is estimated at about 2,771,400 b/d*, or 10% above the last pre-

(Text is from a speech delivered before the Marine Oil Panel of the American Merchant Marine Institute on October 18 at New York City.)

*Barrels per day.

Pacific World Trade

war year, 1938. However, as our meeting here is concerned with that part of this foreign demand which requires transportation by tankers and other seagoing vessels, we should eliminate from this figure at the outset the part of this demand represented by Russia, as our estimates indicate that that country should be largely self-sufficient in petroleum supplies. Excluding Russia, which represents 795,700 b/d in 1947—a 42% increase over 1938—the total 1947 foreign demand is estimated at 1,975,700 b/d, or only 1% over the 1938 pre-war figure, 1,954,600 b/d. This foreign demand is broken down into main consuming areas as follows:

	B/D	
Western Hemisphere, excluding U. S.	678,100	39% increase
Europe, excluding Russia	689,300	26% decrease
Asia	270,700	5% decrease
Africa	173,600	36% increase
Oceania	164,000	32% increase

Therefore we see that whereas the Western Hemisphere, excluding the U. S., is expected to increase by 39% in 1947—and increase is likewise reflected in the smaller consuming areas of Africa and Oceania—the consuming areas affected by war damage and dislocation, Europe and Asia, are expected to be able to absorb 26% in the case of Europe and 5% in the case of Asia less than pre-war. Another interesting factor is that Europe, which before the war required substantially more than Canada and Latin America, will be able to absorb in 1947 an only slightly larger amount. The weighted average result in all these foreign areas—excluding the U. S. and Russia—is an estimated increase of only 1% in requirements for 1947 as against pre-war in 1938.

Projecting our estimates next over the short-term period 1947 to 1950, we see the effect of the progressive restoration of normal consuming operations in decidedly increased requirements. Our survey indicates that by 1950 the total foreign demand in both hemispheres—excluding the U. S. and Russia—should be in the neighborhood of 2,471,700 b/d, or 25% above the 1,975,700 b/d for this foreign area, in 1947. This clearly indicates an increasing demand for seagoing transportation during this period.

The breakdown as between areas of this 1950 demand is estimated as follows:

	B/D	
Western Hemisphere, excluding U. S.	793,400	17% increase
Europe, excluding Russia	951,700	38% increase
Asia	355,800	31% increase
Africa	188,300	8% increase
Oceania	182,500	11% increase

As a matter of interest, the Russian demand is estimated to increase to 898,000 b/d, an increase of 13%.

Here we see increases throughout, particularly in Europe, reflecting a return to more normal demand relationship between this area and Canada and Latin America.

While these estimates have all been based upon 1947 as a post-war starting year, the unexpectedly early termination of the war has projected them forward so that I believe we can reasonably estimate demand in 1946 as approximating the figures above reviewed for 1947.

When it comes to attempting to project these estimates over the long-term period from 1950 to 1960 and 1965, you will appreciate that we get more than ever into the realm of crystal gazing in which one prophet's word is no better or worse than another's. The effort being made here to do this is based upon considerations and increments which govern the upper trend of petroleum consumption during the period 1927 to 1942 in the Western Hemisphere and 1927 to 1938 in the Eastern Hemisphere. The total demand for countries of the Western Hemisphere, outside of the United States, is estimated to continue an average annual upward trend of about 18,000 b/d. In the Eastern Hemisphere, excluding Russia, a higher annual gain of, say, 90,000 b/d is reasonably anticipated over the pre-war period of 1927 to 1938. One reason for the expectancy that this rate of gain may

Gordon Michler, Standard Oil Co. of N. J., speaking at the Marine Oil Panel of the Merchant Marine Conference, October 18. Seated, E. A. Benerly.



materialize is because of the extremely low levels to which petroleum demand fell during the war period, particularly in enemy-controlled countries.

On the basis of these projected trends, total foreign demand of petroleum crude and products, excluding Russia, by 1965 is estimated at approximately 3,900,000 b/d, or about double the 1938 quantity. By way of comparison, domestic demand for crude and products within the U. S. in 1938 was 3,115,000 b/d. In other words, the foreign demand should, by 1965, outstrip the demand in our own country in 1938.

To break down this 1965 demand into areas, our estimates show the following:

Western Hemisphere, excluding the U. S., should, by 1965, be something over 1,000,000 b/d as compared with 678,100 b/d in 1947.

In Europe, excluding Russia, 1,820,000 b/d, or just short of three times the 1947 figures of 689,300 b/d.

In Asia, 555,000 b/d as against 270,700 b/d in 1947.

In Africa, 300,000 b/d as against 173,600 b/d in 1947.

In Oceania, 220,000 b/d as against 164,000 b/d in 1947.

The estimates to which I am referring do not attempt to translate this foreign demand for petroleum products into the number of tankers and accessory cargo vessels that would be required to transport this amount of petroleum crude and products from principal supply sources to the foreign markets in these respective areas. You gentlemen, as members of the shipping fraternity, can presumably do that, bearing in mind that the principal supply source as far as the Western Hemisphere, excluding the U. S., is concerned would be the Caribbean, and as far as Europe is concerned, should be the Caribbean and the Near East. As already referred to, the Caribbean should, to a large extent, replace the U. S. in exports, perhaps within the short-term period of this review. This should not greatly vary your calculations from the standpoint of supplying Canada, Latin America or Europe, as Caribbean supply sources are reasonably equidistant to U. S. gulf sources in effecting shipments to most of these markets. The situation in the Near East may undergo some changes in the future, due to pipeline construction, that would make more products available for shipment to Europe from the eastern end of the Mediterranean. Tanker transportation from this area to the majority of European markets is roughly equidistant to that from Caribbean sources, so that here again the prevailing source of supply should not greatly alter tanker transportation requirements.

I assume that one question which is uppermost in your minds is the amount of seagoing petroleum transportation, principally tankers, that would be occupied in supplying the requirements of the various foreign areas to which I have referred. As I understand the problem, in general world tanker transportation pre-war amounted to roughly 17,500,000 deadweight tons. A substantial part of this tanker tonnage has been destroyed during the war and the balance is comprised largely of tankers that are small in capacity and slow in speed, according to present standards. I also understand that there has been constructed in the U. S. during the war something over 11,000,000 deadweight tons of modern, large capacity, high speed tankers, which, due to these factors, would approximate 15,000,000 deadweight tons in terms of pre-war speed and carrying capacity. The post-war world tanker capacity—about which, again, you gentlemen know far more than I—is reported to be about 21,000,000 deadweight tons. Owing to increased speed and capacity, this might be represented at about 25,000,000 deadweight tons for purposes of comparison with the 17,500,000 deadweight tons in operation before the war. The question, therefore, is how far the foreign demand for petroleum transportation, according to the figures which I have tried to sketch here—in addition to the U. S. coastwise transportation demand, which I have not attempted to refer to in this review—will go in employing this impressive amount of post-war tanker capacity.

Merely as an indication of the effect of the foreign demand upon tanker requirements, a rough review of the foregoing foreign requirement figures for the Western Hemisphere, excluding the U. S., and for Europe, excluding Russia, indicates the following numbers of T-2 tankers would be required to supply these two foreign areas. I would like to make it clear this is not an accurate estimate based upon a breakdown of the various products and crude with their differing gravities that will have to be hauled, or a breakdown as between the countries in these areas, which of course substantially affects the lengths of the haul concerned. Such a detailed analysis might result in quite different figures. I am only attempting here to sketch roughly the number of tankers that would be required to move the above estimated supplies to these two foreign areas on the hypothetical assumption that the movement in the Western Hemisphere would be Caribbean to Rio de Janiero, Brazil*, all carried in T-2 tankers. However, on this purely conjectural basis, the number of T-2 tankers that would be required, Caribbean to Rio de Janiero and Caribbean to London, to provide the Western Hemisphere and European requirements referred to in this review, would be:

	CARIBBEAN TO RIO DE JANIERO		CARIBBEAN TO LONDON	
Year	B/D	T-2 Equivalent	B/D	T-2 Equivalent
1938	487,800	84	930,900	217
1947	678,100	117	689,300	161
1950	793,400	137	951,700	222
1955	803,000	139	1,220,000	284
1960	904,000	156	1,520,000	354
1965	1,005,000	173	1,820,000	424

Perhaps the important figures to bear in mind are the fact that as against a world tanker tonnage increase of from about 17,500,000 deadweight tons pre-war to, say, 25,000,000 deadweight tons post-war—in terms of pre-war carrying capacity—an increase of roughly 40% in carrying capacity, the foreign demand for petroleum crude and products that would require such transportation will, in 1947, probably amount to only about 1% more than in 1938, but is estimated to increase by 1950 by 25%. As we have been called upon to discuss only the foreign oil

(Continued on page 674)

* And to Europe, Caribbean to London.

Pacific World Trade

Dutch Trade Director Reports on East Indies

What is probably the first authoritative commentary on the industrial and agricultural situation in the Dutch East Indies since Japanese surrender was revealed with the release by the Netherlands Information Bureau of a report by G. J. Schimmel, trade director in the economic affairs department of the Netherlands East Indies Government.

According to Mr. Schimmel, now in Batavia, Java, approximately $400,000,000 worth of chemicals and machinery alone will be necessary to put the Indies on a firm basis in the world's economic system.

He estimates that much damage has been done to machinery and factories in both the tea and sugar industries, and that of all the staple products of the Indies, rice alone was permitted normal production by the Japs.

The report states that among the reasons for failure to maintain the pre-war production of the Indies were forced diversion of farm labor to produce castor oil for lubricants, and diversion of food-producing acreage to almost completely unsuccessful efforts to grow cotton and china grass.

The results are:

Rubber trees have been neglected on both small farms and plantations, and about 10 per cent have been cut down. However, "no decisive harm" has been done and pre-war production of 650,000 tons annually for export may be available within a year, provided a "vigorous industry" is reestablished.

Sugar—A large amount of the 1,500,000 tons of sugar, which some estimates have given as now available in Java, has not been sacked. Because of looting in Java, principal sugar producer, it is questionable how much of the sugar will be left for export by the time law and order are restored.

Many of the sugar factories were stripped of their machinery, while others were converted to alcohol and lubricant production by the Japs. The industry, however, should be in "reasonable shape" within two years, with a 1947-48 production of from 1,500,000 to 2,000,000 tons expected.

Tea—About one-half of the Indies tea production was deliberately destroyed by the Japanese, including factories and machinery. It might be necessary to "start anew and rebuild the tea industry."

Comparative figures on other products show losses:

	1941	1944
Maize	2,400,000 tons	1,800,000 tons
Cassava	8,500,000 tons	5,500,000 tons
Soy Beans	345,000 tons	10,000 tons

Production of **palm oil**, in which the Indies was almost entirely self-sufficient, ceased almost entirely.

Rice production was almost normal, with 4,500,000 tons grown in 1941 as compared to 4,300,000 tons in 1944. **Oil** is not mentioned in the report, which deals mainly with agricultural products, but oil has been in production since the earliest landings of Allied troops in Borneo.

"Ships of the Redwood Coast"

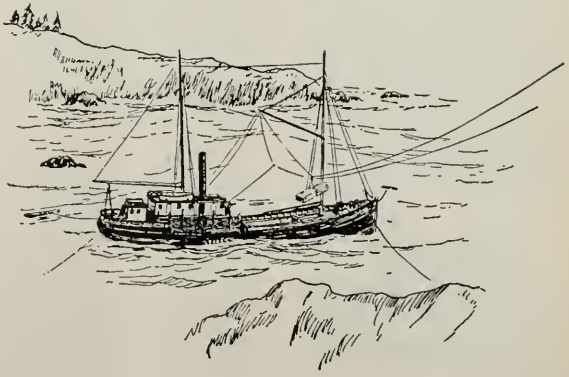
The Stanford University Press has published another book in its series on the early-day West, which includes the popular "Paddle Wheel Days in California," "Cable Car Days in San Francisco," "Bonanza Railroads," and "Via Western Express and Stagecoach."

The new book is "Ships of the Redwood Coast," by Jack McNairn and Jerry MacMullen. Here is the intriguing account of the little ships with the huge deckloads of lumber that plied the California, Oregon, and Washington coasts, and of the men who operated and sailed them.

It is the story of the lumber country, "Paul Bunyan's Country"; of the Mendocino dog-holes, the open coves where the ships were loaded from wire chutes; of the cargoes, the wrecks, the tycoons, the famous old skippers—Hog Aleck, Flatfoot Hanson, Caspar Charlie, Midnight Olsen, and many others.

Many of the anecdotes which heretofore have been preserved only in the memories of the individuals concerned are recorded here. The shipping pages of newspapers and the records of the old companies were rich sources of information.

The color and personality of the men and ships that brought the lumber to the cities of California have been captured by the authors in "Ships of the Redwood Coast."



Another Big Company Establishes New International Division



Charles T. Zaoral, general manager, International Division, Bendix Aviation Corp.

The formation of a new division to handle the comprehensive foreign trade program of Bendix Aviation Corporation was disclosed recently by Ernest R. Breech, president.

Bendix International will be under the direction of Charles T. Zaoral, general manager, who joined the corporation in January as coordinator of foreign affairs, after many years of experience in the foreign field for General Motors Corporation and Dodge Brothers, Inc.

The new division will handle throughout the world, with the exception of the United States and Canada, the products of the 17 divisions of the corporation. It has established headquarters at the corporation's New York office, 30 Rockefeller Plaza, and will maintain a staff of engineering, sales and service personnel which will be expanded here and abroad as world conditions permit.

The corporation has long had contractual relationships with outstanding manufacturers and distributors in the automotive, aviation, and marine fields in many important centers abroad. In many instances, the activities of these manufacturers and distributors are aided by Bendix-trained technicians overseas.

Bendix International was established to develop as fully as possible the opportunities for two-way international trade presented by the engineering, manufacturing and distributing resources of 17 divisions of Bendix.

"It is our belief," said Mr. Breech, "that a vigorous foreign trade is essential not only to the enjoyment of a high standard of living in this country but also to the maintenance of the best relations among nations. We expect our International division to contribute materially to the corporation's ability to maintain a high level of employment in our domestic plants, and to play an important role in the interchange of engineering knowledge and its most useful application everywhere.

"During the war years, the people of many large geographical areas and densely populated regions have, through the operations of our Army and Navy, come to appreciate fully the utility of planes, trucks, jeeps and ships, and of the many Bendix products with which they are equipped. We have had ample evidence already of the interest in the peacetime sale and service of Bendix products overseas which has resulted from the coming of aviation and mechanized transport to these areas."

The Plan

The broad policies which have been established for Bendix International were explained by Mr. Zaoral, who emphasized that the company's activities would be developed abroad through three main channels, as determined by the situations in the various foreign countries. They will be, he said, export sale of products which the company manufactures here; manufacture by Bendix of its products abroad, and licensing of foreign manufacturers to manufacture Bendix products abroad.

Chiefly through license arrangements, many of the corporation's products, such as Stromberg carburetors, Eclipse starters, Pioneer instruments, brake systems, and many others, have long been widely used on automobiles, airplanes and ships produced in the international field, it was stated.

Will Import, Too

"While seeking the most efficient means to bring the developments of the company's engineering to users throughout the world," Mr. Zaoral said, "we also intend to foster the sale here of such products invented or manufactured abroad as can find a profitable market in the United States. We recognize that the United States must buy as well as sell abroad in order to contribute to the maintenance of a balanced international economy. The full resources of the corporation, which now include a nationwide independent distributing organization established to merchandise Bendix radios and radio-phonograph combinations for the home, will be utilized in achieving the most satisfactory two-way participation of Bendix in the expanded foreign trade which is confidently anticipated when peace is restored.

"Despite its own extensive engineering accomplishments, Bendix is fully cognizant of the fact that important scientific advances are not limited to the brains of any one nation.

"Bendix engineers in the past have worked closely with individual inventors and outstanding engineering and scientific groups abroad, and with technicians of many foreign companies in the allied industrial fields which the corporation serves. Our International division therefore will continue to maintain an 'open door' policy to the inventors of all nations, in the interest of furthering industrial science and service to the public."

Other appointments to the new division, in addition to Mr. Zaoral, include: F. A. Stanton, foreign patent counsel, who represented Bendix in Paris for many years and will make his headquarters in New York; L. B. Coates, division comptroller, formerly of the central staff; Paul Moss, sales manager; Harold McEnness, assistant sales manager. Fernando Jose Cardenas, formerly with Westinghouse, General Electric and Sylvania, is manager of Central and South American territories.

Pacific WORLD TRADE

China-America Council's

Moves for Industrial Development

Mission to China

The China - America Council of Commerce and Industry announces, through the Council's San Francisco Regional Chairman, H. D. Collier, chairman, Standard Oil Company of California, that plans formulated last spring to send a trade and industrial mission to China as soon as possible had been approved by both the American and Chinese Governments and that arrangements for the group's early departure are now being completed. A formal invitation from the Chinese Government was extended through Premier T. V. Soong at a conference during September in Washington with the Executive Committee of the China - America Council of Commerce and Industry, shortly before Dr. Soong's return to China.

"For more than a year," Lee H. Bristol, president of the China-America Council of Commerce and Industry, said, "the Council has had under advisement the sending of a businessmen's delegation to China and the establishment of an office there. The ending of the war in the Far East has made it feasible for us to put these plans into action very shortly. The mission's purpose will be to survey economic conditions in China and to confer with Chinese officials, industrialists and financiers on the early resumption of trade between the two countries and on ways of encouraging cooperation of American business in the industrial development of China."

In response to the China-America Council of Commerce and Industry's proposal, William L. Clayton, Assistant Secretary of State, wrote on July 9 to Blackwell Smith, chairman of the Council's Executive Committee: "I have discussed your suggested undertaking with the interested divisions of the Department and find general agreement to the effect that such an undertaking could be useful in promoting friendly relations between American and Chinese businessmen and could aid in establishing mutually profitable post - war trade between the United States and China. The Department, of course, is entirely sympathetic with these objectives."

"The China-America Council of Commerce and Industry," Mr. Bristol said, "has been working closely with the agencies in this country responsible for developing the plans for China's post-war rehabilitation and reconstruction. These plans call for purchase of two billion dollars worth of American equipment and supplies in the next few years.

"The studies the China-America Council of Commerce and Industry has made in recent months have strengthened our conviction that the post-war reconstruction of China presents a challenge and an opportunity to American business perhaps greater than exist anywhere else in the world. With the return of Manchuria and Formosa to Chinese control there can be no doubt that China possesses sufficient natural resources to make possible a great industrial and agricultural development. China's leaders have indicated they are looking forward to receiving the close cooperation of American industries in this development, and that the Chinese Government will take steps to provide proper protection and encouragement for the investment of American capital in China.

"These factors provide the background for a sound and growing two-way trade between the two countries. Before these opportunities can be realized, however, a great many practical questions need clarification. In view of the eight long years of war and destruction and Japanese occupation, there are many gaps in our knowledge of the Chinese economy and the potentialities of China's industrial development and foreign trade. A survey of these matters by American businessmen and financiers and frank discussions with Chinese leaders will be of invaluable assistance in helping to guide American business in post-war trade in and with China."

The program of the Council's mission and its personnel, Mr. Bristol stated, are now being worked out. He indicated that top officials of some of the foremost American manufacturing concerns and banks have expressed a willingness to serve on the delegation.

According to H. D. Collier, the San Francisco Bay Region will be directly represented on the mission, the name of the individual to be announced later.



A FRIEND OF CHINA
Major-General Patrick J. Hurley, U. S. ambassador to China.

Machine Tool Advisory Committee for China Exports

Formation of an advisory committee of machine tool manufacturers to explore ways whereby the American machine tool industry can participate to the maximum extent in the industrialization of China was initiated at a conference in New York on September 26 of representatives of a score of outstanding machine tool companies, called by the China-America Council of Commerce and Industry. After an extended discussion, led by Ralph E. Flanders, president of Jones and Lamson Machine Company, it was agreed that the

China - America Council, of which Mr. Flanders is a director, should set up an advisory committee of machine tool executives to confer with the official Chinese planning and purchasing agencies in New York.

Preceding the discussion, China's machine tool needs for her initial reconstruction program were outlined by Alex Taub, consulting engineer for the reorganized Chinese Supply Commission in America. This program calls for the purchase in this country during the next three years of approximately $2,000,000,000 worth of machinery, equipment and materials for the rehabilitation and expansion of industry, transportation and agriculture in China. The machine tool purchases for this program are estimated at scores of millions of dollars.

Although for an indefinite period ahead China will have to depend on foreign countries for most of her machinery and equipment requirements, Mr. Taub pointed out, she will also make a start in producing part of these needs domestically. "The Chinese leaders," he said, "are determined that China must be made at least partially independent of outside sources of supply in the manufacture of certain basic equipment." This process of industrialization, he declared, would make China a steadily growing market for American industry and provide great opportunities for American machine tool builders.

Among the plants included in the initial reconstruction program for China which will require much imported machine tools and allied equipment are those in the following industries: electrical equipment, telephone and telegraph equipment, radio and broadcast equipment, wires and cables, batteries, medium and light machine tools, heavy machine tools and industrial equipment, hand tools, automotive equipment, diesel and steam engines, compressors, turbines, pumps, boilers, textile machinery, small agricultural implements, well drilling equipment, locomotives and railroad cars. Approximately 25 enterprises are planned for these industries, with imported machinery and construction materials required for them estimated at more than $150,000,000 during a period of three years. In almost every case, it is pointed out, the products to be turned out by these plants will make up only a small part of China's requirements.

"It would be highly advantageous for the American machine tool industry," Mr. Taub said, "to cooperate in an organized way with Chinese technicians and executives now in America. An advisory group representing the industry would be able to help the Chinese determine the most suitable types of equipment for the given purposes and to cooperate in training Chinese mechanics and technicians and in insuring the most effective use of American equipment in China. This in turn will create increased good will and help to insure a large, continuing market in China for American machine tools."

Mr. Flanders emphasized the preference of the Chinese for American equipment and technical skill. He pointed out, however, that the American machine tool industry would be in a position to render effective assistance to China only when the Chinese had definitely determined on the products and designs to be manufactured.

The machine tool advisory committee of the China-America Council, under the leadership of Mr. Flanders, is expected to have a preliminary conference with the Chinese authorities in the near future. Representatives of the machinery firms attending the China-America Council conference included the following: M. R. Sacra, The Black & Decker Mfg. Co.; Joseph R. Keller, The Black Rock Mfg. Co.; R. J. Ahern, Billings & Spencer Co.; Val C. Hart, The Bullard Company; Nelson F. Caldwell, Cincinnati Milling Machine Co.; Henry Chaplin and Jaques A. Gerard, Cone Automatic Machine Co., Inc.; Albert Meyers, Consolidated Machine Tool Corp.; H. C. Alpaugh and W. E. Huntley, DoAll International Company; Stewart Elliott, Ex-Cell-O Corporation; Cecil M. Peter, The Fellows Gear Shaper Co.; Glenn Spohn and A. C. Wais, General Machinery Corporation; J. C. Hebert, Roy Jacobs and J. R. Knight, Jones & Lamson Machine Company; L. H. Roemer, The R. K. LeBlond Machine Tool Co.; Charles Gross, Murchey Machine & Tool Co.; F. W. Altorfer, The National Acme Company; Ralph How, New Britain Machine Company; Charles F. Myers, Republic Drill & Tool Co.; T. B. Buell, Sundstrand Machine Tool Company; Noble Clark, The Warner & Swasey Company.



Alvin C. Eicholz
New manager, World Trade Department, San Francisco Chamber of Commerce.

Appointment of S. F. Chamber World Trade Manager

Appointment of Alvin C. Eicholz as manager of the World Trade Department of the San Francisco Chamber of Commerce has been announced by Louis B. Lundborg, general manager of the Chamber. He will take over his new position on November 1.

Eicholz is a former San Franciscan, having served as commercial agent in the district office of the Bureau of Foreign and Domestic Commerce, following a period of service for the Bureau in both South America and Washington, D. C.

In 1934 he transferred to the Bureau's Los Angeles office as Assistant District Manager, and in 1942 joined the staff of the Los Angeles Chamber of Commerce as Assistant Manager, World Trade Department, in charge of trade promotion activities.

During his association with the Bureau of Commerce he inaugurated a trade promotion plan of counseling manufacturers in foreign trade programs, opportunities and techniques. Later, while on the staff of the Los Angeles Chamber of Commerce, he was responsible for inaugurating, organizing and conducting basic trade promotion for post-war which included the organization of World Trade Clinic. He has authorized a number of books surveying trade in foreign countries.

Comparison of Credit and Collection Index Figures for Latin America

Credit Conditions

	July 1945	Jan. 1945	July 1944
Argentina	280	277	288
Bolivia	252	237	248
Brazil	297	292	290
British Possessions	290	289	293
Chile	286	283	281
Colombia	295	292	288
Costa Rica	270	278	275
Cuba	297	297	287
Dominican Republic	270	277	271
Ecuador	265	261	267
French Possessions	Not Rated		
Guatemala	279	282	274
Haiti	263	279	268
Honduras	265	255	252
Mexico	297	294	294
Netherlands Poss.	289	288	273
Nicaragua	263	257	253
Panama	288	290	286
Paraguay	262	264	247
Peru	289	291	285
Puerto Rico	296	294	280
El Salvador	275	270	265
Uruguay	284	281	285
Venezuela	292	296	291

CREDIT—

Good: 250 and up. Lowest percentage 50% good, 50% fair.

Fairly Good: 225 to 250. Lowest percentage 25% good, 75% fair.

Fair: 200 to 225. Lowest percentage 100% fair.

Poor: 175 to 200. Lowest percentage 75% fair, 25% poor.

Very Poor: Below 175.

Collections

	July 1945	Jan. 1945	July 1944
Argentina	93	91	100
Bolivia	68	76	86
Brazil	100	100	97
British Possessions	98	98	100
Chile	97	97	100
Colombia	100	100	100
Costa Rica	97	97	100
Cuba	100	100	100
Dominican Republic	100	100	100
Ecuador	69	90	95
French Possessions	Not Rated		
Guatemala	100	100	100
Haiti	100	100	100
Honduras	94	95	97
Mexico	100	100	100
Netherlands Poss.	100	100	100
Nicaragua	69	93	94
Panama	100	100	97
Paraguay	69	94	100
Peru	100	100	100
Puerto Rico	100	100	100
El Salvador	95	98	97
Uruguay	99	98	100
Venezuela	96	99	100

COLLECTIONS—

Prompt: Over 70% prompt or fairly prompt collections.

Fairly Prompt: 50% to 70% prompt or fairly prompt collections.

Slow: 40% to 50% prompt or fairly prompt collections.

Very Slow: Less than 40% prompt or fairly prompt collections.

T. K. Chang
Recently appointed consul general for China at San Francisco. He succeeds C. T. Feng, now Chinese ambassador to Mexico.



Nine Foreign Banks in China Get Permission to Resume Operations

Nine foreign banks have been given permission by the Ministry of Economic Affairs to resume operations in China.

They include the largest British bank in the Far East, the Hongkong and Shanghai Banking Corporation. The three American banks reopening soon are the National City Bank of New York, the Chase Bank, and the Underwriters Savings Bank.

Others are the Chartered Bank of India, Australia and China, the Banque Belge pour L'Etranger, the Netherlands Trademans Bank, the Mercantile Bank of India, and the Nederlandsch Indische Handelsbank.



Ray E. Waterlow.

Waterlow To Frazar and Hansen

R. E. Waterlow, for 15 years in the marine, sales and foreign trade departments of Standard Oil of California, has joined the staff of Frazar and Hansen, international merchants, and will specialize in sales promotion.

Waterlow has twice been president of the Junior Foreign Trade Association of San Francisco, and vice chairman of the international relations committee of the U. S. Junior Chamber of Commerce. He is a member of the World Trade Association of San Francisco, the Bay Area World Trade Promotion Committee and the Export Managers' Club of San Francisco.

The firm of Frazar and Hansen has world-wide distribution of technical equipment and materials, and during the war shipped 60 lines of products to 40 countries.

Swedish Ship Construction During War

No less than about 150 vessels, totaling over one million tons deadweight, were ordered at Swedish shipyards early in 1945, "Svensk Flagg," the Swedish Shipping and Merchant Aviation Journal, reports in its 1945 annual issue. More than half of the orders had been placed by Norwegian ship-owners.

In 1944 Swedish yards delivered altogether 51 merchant vessels, with an aggregate deadweight tonnage of 302,800 (192,100 gross tons). Launched were 45 cargo boats, totaling 250,200 tons d.w. (158,400 gross tons). Production was hampered by shortage of materials. Imports of shipbuilding materials came to a standstill in the fall of 1944, when Sweden's trade with Germany ceased.

During the last five years launch-



THIS EXPORT SHIPPING PROBLEM SOLVED

A 54-ton boiler which is being shipped overseas in four "packages" to aid in post-war reconstruction, ready for a test run at the Kent, Ohio, branch assembly plant of The Babcock & Wilcox Company, manufacturers of steam generating equipment. The package units, which are destined for Russia and China, are designed to produce 12,000 pounds of steam per hour, generate 500 kilowatts each, have an operating pressure of 300 pounds per square inch and a superheater temperature of 700 degrees F. They are designed to burn wood, peat or low-grade coal.

ings at Swedish yards totaled:

	Tons deadweight
1939	328,000
1940	235,000
1941	250,000
1942	215,000
1943	225,000

Earnings of Merchant Fleet Off 15 Per Cent During 1944

Gross earnings of the Swedish merchant fleet amounted to 362 million kroner ($90.5 millions) in 1944, as against 431 millions ($107.75 millions) the year before, according to a report recently published by the Swedish Board of Trade and Shipping. Shipping between Sweden and foreign ports decreased by over 37 per cent during 1944. Imports to Sweden, calculated in tons, were reduced by 24 per cent, while the volume of exports shrank by 49 per cent.

Pacific World Trade

MARINE ASPECTS

(Continued from page 668)

situation, you will, of course, understand that these figures do not include any estimates for transportation requirements between U. S. ports, either coastwise from the U. S. Gulf to North Atlantic, intercoastal from California to the East Coast, or possible imports from such sources as the Caribbean to U. S. ports. U. S. consumption requirements are, of course, considerably heavier than those in the foreign areas which we have been reviewing—for example, an estimated 4,395,000 b/d in 1947, or more than double the foreign requirement figure excluding Russia, which we have referred to for that year. This emphasizes the importance to tanker transportation of that part of these U. S. requirements that will require tanker movement.

As previously stated, you gentlemen of the American Merchant Marine Institute are best qualified to make your own calculations as to the amount of tanker tonnage and accessory cargo vessel capacity that will be required to meet the foreign demands for delivery of petroleum crude and products which we have tried to estimate for you. I was advised by the chairman of this panel that what you would be interested in principally, in hearing from oil people such as ourselves, is the amount of oil that it appears will need to be transported to foreign areas in the immediate post-war years, and the trend for the further future, and some indication of the amount of transportation opportunity which will be offered to the magnificent ships of the American Merchant Marine, which have done so much to carry this war. Again let me sound a word of caution that unforeseen factors, such as the possible operation of a sterling block or a depression, such as followed the last war, drastically affecting industrial operations, hence fuel consumption, might materially alter the best guesses that we can try to make in looking into the crystal ball of the future today. As to supplies of petroleum crude and products for the demands referred to, I think you can take it that the oil industry, and very definitely the American oil industry, will meet that part of the situation. As to facilities for loading and discharging these supplies, including the latter in war-torn countries, I think you can also take it that these will be adequately rehabilitated to handle the demand. I am not endeavoring to touch on the question of fuel oil bunker supplies, or their availability to the American Merchant Marine vessels carrying not only oil but the very much greater movement of general cargoes to world-wide ports, as Mr. Crawford has dealt with this phase of the subject. However, it appears an obvious conclusion that with the movement of so much oil supply to various ports of the world, bunker supplies should be adequately provided. It is certainly the intention, insofar as I know it, of the American petroleum industry to lend every possible cooperation in this regard, as well as in connection with the transportation of oil cargoes, to the American Merchant Marine.

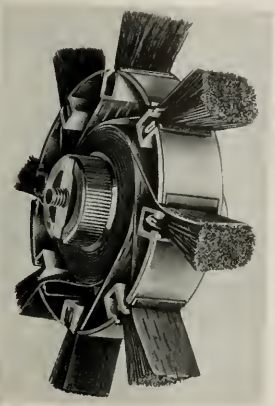
KEEP POSTED

(Continued from page 658)

All-Purpose Sander

A new brush-backed sanding wheel, to be known as the Sand-O-Flex, was recently announced by the Exactone Tool & Die Company, Hollywood, Calif. It sands, deburrs, finishes woods, metals, plastics, rubber products and many types of special materials. The outstanding feature of this sanding device is its adaptability to jobs that were formerly done only by hand.

The device consists of a central magazine which houses the strip abrasive. Eight of these strips extend through the housing and are held against the work by tough bristles. The bristles "cushion" the abrasive, making it possible to get in and around corners, hollow and fluted surfaces, and small openings.



The body and cover of the Sand-O-Flex are cast from Zamak. Overall diameter (including brushes) is approximately 8". Weight fully loaded is about 2¾ lbs. Normal loading contains 20 feet of abrasive, and reloading is done simply by unscrewing the serrated nut and removing the cover. A wide range of abrasives of various grits and grades are supplied for use with the sander. These cartridges, plus the quick-changing feature, permit the same tool to be used in all operations from rough stage to polished surface.

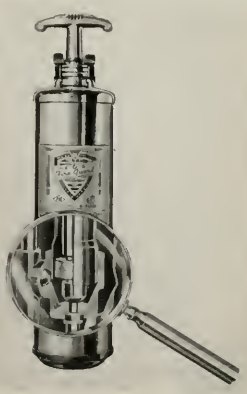
The Sand-O-Flex fits all standard ½" and ⅝" motor shafts, stationary or flexible, or can be supplied to fit almost any shaft size on request. A ¼-hp electric motor will handle all normal operations. Motor speed of 1750 rpm is recommended, decreasing in proportion to the coarseness of the abrasive used and according to the results desired. No particular skill is required to operate, nor is much pressure necessary to obtain a good finish—the abrasive does the work. Light in weight, the sander is particularly suitable for use on a flexible shaft.

Liquid Type Fire Extinguisher

A lightweight vaporizing liquid type fire extinguisher is offered by the General Detroit Corporation. Called S.O.S. Fire Guard, this extinguisher is standard equipment on the Army's newly-announced troop and supply carrier, the Weasel. Because of its small size (1 or 1½ quart), the Fire Guard may also be installed on trucks, cars, boats and planes. Its action is said to be particularly fast on electrical, oil and gasoline fires.

One of the outstanding features claimed for this fire fighter is a patented "Safety Phlare" design of the lower end of the pump cylinder (shown in illustration). The cylinder is expanded at the bottom to insure immediate free-floating piston action even after long periods of disuse. Yet in the remainder of the cylinder felts fit snugly to insure top operating efficiency. Absence of metal-to-metal contact in the expanded section eliminates the possibility of piston sticking to cylinder wall.

Other features include a panic-proof safety lock actuated by turning handle either right or left. Locking shoulders are pyramid shape for easy turning. Cap, stuffing box, handle lock, and handle seal are a single piece brass drop forging, eliminating all interior soldered joints.



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The manufacturers of the new equipment announced in this department will be pleased to furnish complete details without obligation on your part. For quick service, please use this coupon.

PACIFIC MARINE REVIEW

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(Identify by name of manufacturer and machine)

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A Handy Traction Dynamometer

In many applications of manual and mechanical power it is necessary to measure the force applied with considerable accuracy. For this purpose W. C. Dillon and Co. Inc. of Chicago manufacture the carefully designed and ruggedly simple traction dynamometer shown in the illustration herewith.

This device, hooked into any system of linkage or power application set-up, measures and indicates the force applied. Many of these instruments are in use in the yards and on the ships of the U. S. Navy, and they would be of great service on merchant ships, on docks, and in commercial shops and shipyards.

The instrument illustrated is the Model AN. Its dimensions (without shackles) are 8¼ inches long, 6¼ inches tall and 3 inches deep. Its weight is 8 lbs. 4 oz. The dial is a satiny black with silver numerals. Maximum setting hand is red, main indicating hand is white, and the glass is shatter-proof. The instrument is always shipped with a heavy steel carrying case and super test shackles. Its normal capacity is 10,000 pounds.

In connection with various easily assembled set-ups this traction dynamometer can be used to: weigh materials up to five tons; test the tensile strength of materials, or welded or riveted joints, or linked assemblies; check accurately the tension applied to members designed to operate under tension; test static loads on various members of fabricated assembles; or test friction loads due to various causes.

One of these dynamometers could easily pay for itself in a very short time in any engine room aboard ship.

Lighter Life Nets

Six transports built by Kaiser at the Vancouver yard went to sea with equipment weighing nearly three tons less than that previously used, due to the installation of Viking lightweight life nets.

The Viking multiple life nets weigh approximately 42 per cent less than those made from chain, which have been used in outfitting all ships heretofore. This saving in topside weight is of course very important. The weight saving on the numerous nets required to outfit the six ships amounts to a total of 16½ tons. Although weighing less than the chain nets, these made of wire rope are at least twice as strong. This wire rope net is the first lightweight net to receive Coast Guard approval. The fact that they are more flexible has been found particularly advantageous in lifeboat drill, where bulkiness of the chain nets, as well as their additional weight, requires considerable man power to handle. A 40-50-ft. Viking life net can be handled by two men.

In the construction of the life net, one-fourth-inch galvanized plow steel wire rope is used for all suspension members. Staggered hardwood rungs allow a short length of free standing rope between adjacent rungs, increasing the flexibility. The nets permit free hand and toe holds, wood booms spaced at intervals serving to keep the nets at a distance from a ship's side. A pipe boom is used at the lower end to hold the net in proper alignment.

The Viking Marine Company also manufactures a reversible, non-tilting, non-skid, lightweight pilot ladder. This obtained great popularity among pilots and seafaring men. Another product is a bulwark ladder with reversible hand rails to care for different angles and to form a protection at gangway railings.

C. J. Hendry & Company are territorial agents and wholesale distributors in California.

Strainer for Machine Tools

A time-tested device that increases production, decreases rejects and effects higher precision and longer periods of uninterrupted work, is manufactured by the Strainer Products Corporation, Montclair, N. J. This device, known as the Strainco-Metex Unit, is a precision-engineered, non-clogging industrial strainer for use with turret lathes, screw machines, grinders, and all other machine tools



Strainco-Metex Model C coolant and cutting oil strainer.

that employ a cutting oil or coolant flow.

These strainer units increase production by assuring practically uninterrupted machine operations. They not only provide exceptional long-period capacity to hold dirt, chips and grit, but strainer refills are easily installed and old ones washed and ready for re-use in a matter of minutes. The efficiency of the strainer prevents metal cuttings and chips from lodging in the pump, eliminating the once-necessary practice of periodic shut-downs for pump cleaning and repairs.

Because Strainco-Metex Units prevent foreign matter from being recirculated in the coolant fluid, scoring, poor finishes, and other defective work in machine operations are minimized, and rejects decreased. The use of "Straincoed" fluid, moreover, adds to the life of the cutting oil, decreases wear and tear on the tools, and often eliminates lapping operations entirely.

Corkboard Adhesive

A heavy-bodied, waterproof, non-corrosive mastic for fastening corkboard to the interior of ships for heat and cold insulation has been developed by The Dolphin Paint & Varnish Co., Toledo, Ohio, and will be marketed as No. 3880-A Water and Rustproof Dolfinite. It is also designed for use in securely cementing tile deck covering such as Linotile, and will prevent steel from rusting.

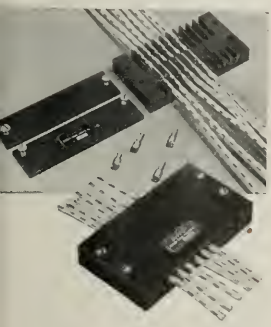
It is an oil base material and no special treatment of the surface is necessary beyond its being clean and having all loose rust removed.

Solderless Connector Strips

These new connector strips, manufactured by Aircraft - Marine Products, Inc., incorporate the company's knife-switch disconnect terminal design. The permanent disconnect member of the splice has an extended tongue which fits snugly into the connector strip. This member terminates in a knife-switch stamping to which any terminal of the knife-switch design may be readily connected or disconnected by holding the free terminal end vertically in contact with the strip member and then pulling back. The resulting connection is a perfect four-point contact giving maximum electrical and mechanical service performance.

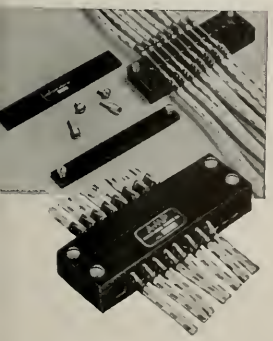
Two types are available: (1) The single-width strip adapted to use with the AMP Pre-insulated Splicing Terminal, which requires no insulation sleeving. The knife-switch part of the permanent member extends outside the strip, and connection and disconnection are made without removing the cover of the assembly. (2) The double-width strip in which the disconnect ends are enclosed, locked and insulated by the cover, one half of which is independent of the other half. Disconnection is made by unscrewing only one half of the cover to expose the connections.

Special stacking screws with threaded heads make it possible to stack permanently a series of AMP strips with the cover screwed on top. The strips may be specified to accommodate any desired number of connections. Any combination of adjacent members may be electrically connected.



Solderless connector strips for single and multiple stacking.

Pre-insulated terminal connector strip.



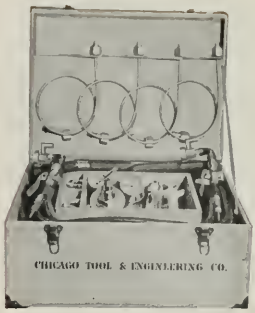
New Underweater Cutting Equipment

Since the sudden ending of hostilities there has been much speculation and thought given to salvaging or removal of ships lying in harbors and sea lanes. In this process the cutting of metal under water becomes somewhat of a major operation.

The arc-oxygen method of cutting metals under water has proved to be the most successful. Experimentations were carried on before Pearl Harbor, and during the war the method was perfected. From actual tests made the arc-oxygen method has proved to be the most economical, and with the availability of the steel tubular electrodes this process of cutting metals under water is open to all interested in this method. The instructions for operating the arc-oxygen cutting torch are very simple, and in just a few hours the diver is able to use this method to its approximate capacity.

Laboratory tests have shown that 1" steel plates can be cut under water at the rate of approximately one foot per minute. In plates of lesser thickness the speed of cutting is still greater.

The complete equipment necessary to use the arc-oxygen method of cutting metals under water is simple and inexpensive. The Chicago Tool and Engineering Company has spent several years in perfecting the equipment necessary for this operation,



and is now in position to furnish all of the equipment necessary to carry on this operation. Detailed information is available.

Gyro-Magnetic Compass

For the first time in the history of navigation the masters of small craft —seagoing tugs, towboats, yachts, fishing craft and ferryboats — may now get as steady a compass reading as the navigator of an ocean liner. This has been made possible by a new instrument, the Sperry Gyro-Magnetic compass, which was announced as a recent development by engineers of the Sperry Gyroscope Company.

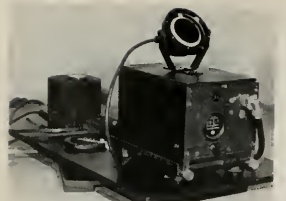
Occupying no more space than a small radio and weighing but 122 pounds, the new compass is put forth as a solution to the long-standing problem of small boats which need indications of greater accuracy than are provided by the conventional magnetic compass but have neither the room nor weight allotment for even the smallest gyro-compass.

In operation, the compass provides for gyro-averaged magnetic compass indications which are transmitted to a conveniently located compass repeater. Two repeaters may be used in cases where more than one direction indication is desired.

The magnetic compass unit of the system has been designed as a separate component in order to make possible its location at any spot aboard the vessel where deviation difficulties may be reduced to a minimum.

Through the operation of the gyro unit, the reading on the compass remains steady no matter how violently the vessel may roll, pitch or yaw.

The amount of power required to



New Sperry Gyro - Magnetic Compass shown is an experimental model with gyro unit in foreground and repeater compass mounted on top. When installed aboard ship, repeater compass is placed in location most convenient for steering. Shown in rear is magnetic compass unit which can be remotely located at place on vessel where it will be subject to a minimum of interference from metals, electrical currents, etc.

(Photo courtesy Sperry Gyroscope Co., Inc.)

operate this new compass is no greater than that called for to produce light in an average size light bulb, and in addition to providing steady direction indications the equipment may also be used to provide automatic steering.

The Thrustorq Dynamometer

Measuring and weighing with air, using an instrument so accurate and sensitive that it will measure the force of a pea from a boy's peashooter or the thrust of a giant jet airplane engine, has been accomplished by the Hagan Corporation of Pittsburgh.

Because of its extreme sensitivity and the simplicity of both its principle and design, the new instrument, called the Thrustorq, already is being used in engine testing laboratories and factories to determine and record the thrust and torque of conventional airplane and automobile engines. A jet airplane engine manufacturer is using the instrument to measure the thrust of a new engine.

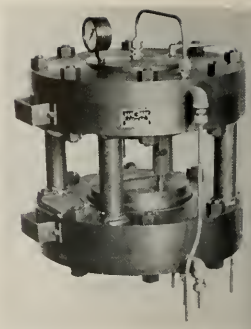
The heart of the instrument is a flexible diaphragm which forms one face of an airtight chamber. Compressed air is admitted to this chamber through a poppet type pilot valve. The force to be measured is applied to the outside of the diaphragm and is opposed by internal pressure. As the force increases, the pilot valve is opened and admits more air to balance the increased force. As the force decreases, air is exhausted until the external force and internal pressure are equal. Thus the air pressure within the chamber provides a direct measure of the externally applied force.

The response of the instrument is practically instantaneous because the diaphragm movement necessary to operate the pilot valve is extremely small.

Because the force is measured by air pressure the Thrustorq permits remote reading on any number of manometers, pressure gages or recording devices. Every person connected with a test may have his own recorder in front of him, even in a different room or different building from that in which the test is being made.

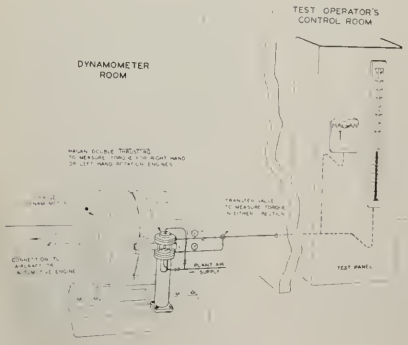
The fact that the new instrument has no intricate mechanisms, knife edges or other parts subject to wear is said to eliminate maintenance entirely.

Since the Thrustorq will function in any position it has been adopted by a manufacturer to measure the torque of vertical helicopter engines. Heretofore conventional torque measuring devices required complicated mechanical linkage that brought on attendant maintenance problems.



This No. 60 Hagan Double Thrustorq is being used to determine the thrust and torque of conventional automobile and airplane engines as well as vertical helicopter engines.

Although the Thrustorq's first application in industry was the obvious one, to measure the thrust and torque of engines, its characteristics have suggested many other uses. Because of its compactness and the fact that it requires almost no deflection to provide a reading of force, the unit can be used to analyze many structural stress and strain problems. The Thrustorq, once installed, needs no attendant, and with a pressure recording device in the system a continuous record can be had even at a remote distance. Its construction permits it to be used under conditions where dust and dirt and cramped quarters previously had precluded the making of measurements.



A typical installation of the Hagan Thrustorq on a cradle dynamometer to obtain the torque or horsepower of an automobile or aircraft engine. With this instrument any number of direct readings or recordings can be had at remote distances from the installation itself.

Fiberglas-Plastic

To meet service requirements in all climates from the Arctic to the tropics, the U. S. Naval Observatory, working with manufacturers, has developed a new type Fiberglas-plastic carrying case for binoculars and other high-precision optical instruments used in the fleet. The cases are made of vinyl and phenolic-impregnated Fiberglas fabric, laminated and formed in a single operation, under low pressure, into the desired shapes.

In addition to affording a convenient means of carrying instruments,



Fiberglas-plastic binocular case developed for use in the fleet by the U. S. Naval Observatory, working with manufacturers. The case is made of vinyl and phenalic-impregnated Fiberglas fabric, laminated and formed under low pressure in a single operation.

a major function of the cases is to provide maximum protection from injury under all service conditions. The semi-rigid but resilient Fiberglas-plastic cases possess high impact and flexural strength and abrasion resistance. These properties, and dimensional stability, are retained at all temperature extremes.

The material is impervious to moisture. It is unaffected by fungi and the bacterial growths that normally attack leather and organic fabric. Unlike many resilient plastic materials, the surface will not oxidize, craze, crack, exude, soften or deteriorate when exposed to contact with oil, perspiration acids or salt water for long periods.

Prior to acceptance for combat service, the cases were subjected to the Navy's standard accelerated weathering, salt spray, impact resistance, warp, flexural resistance and abrasion resistance tests. Tests were made in temperatures ranging from minus 50 degrees Fahrenheit to 160 degrees Fahrenheit, and in relative humidities ranging from 0 to 100 per cent.

Performance of the material has been so successful that a large potential demand for it has been created for other applications where reinforced leather or organic fabric construction has been used. A major potential post-war use is for lightweight, durable civilian luggage.

Boiler Water System

"Things we are able to do with boilers now would not have been believed possible just a few years ago," recently declared George McLean, marine superintendent for the Union Oil Company of California.

This remark was occasioned when one of the company's tankers, the S.S. New London, steamed into its home port after 14 months' continuous service in the South Pacific without the boiler water being changed, and then right out again for another year without even opening the boilers for an inspection. A few days later another of the company's vessels that had been in the South Pacific for almost as long did the same thing.

This remarkable record of continuous service was made possible, Mr. McLean said, because both vessels used the Hall System of chemical boiler water control, which kept the boilers completely free from scale and corrosion.

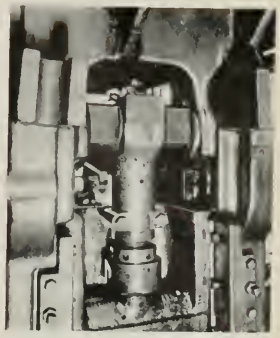
"When the vessels came into port, their voyage log sheets and an analysis of the water showed conditions in the boilers to be perfect," he said. "Since inspections were not mandatory during the war emergency, we knew that the Hall System would continue to protect the boilers for at least another year, and they steamed out again without any delay."

In the past, before Bull & Roberts introduced the Hall System of boiler water conditioning into the marine field, ships' boilers frequently had to be inspected and cleaned after every voyage. Today, half of the high-pressure marine boilers that power America's merchant marine are operating under the Hall System.

Eutectic Low Temperature Welding Alloys

EuteeRod 14, a low melting alloy for the gas welding of cast iron, was used to make a temporary repair on the connecting rod of a giant 75-ton punch press at the Jacksonville, Florida, plant of the Moore Dry Kiln Company in March, 1942. This press with the temporary repair is still in operation. Three years have passed and the welded area has shown little sign of wear or deterioration—conclusive proof that Eutectic Low Temperature Welding Alloys can be used with marked success on large complicated repair jobs.

The following procedure was used in welding the fracture: The fractured edges were beveled to form a 90° "Vee" with a sufficient amount of metal left at the bottom of the groove to provide accurate alignment. Little preheating was required because of the simple shape of the casting. After warming the casting to approximately 300° F., the heat of the oxy-acetylene torch was concentrated on the joint where Eutector Flux 14 had been applied. The weld was accomplished when the weld area reached a temperature of 950-1400° F., well below the melting point of the parent metal.



When the welded connecting rod was put back on the press it was expected that the bearing surfaces would have to be machined before the press could be operated. However, the two bearings were parallel and each end had held so close to the original alignment that it took only a few minutes to scrape the rod bearings and put the press back in operation.

This rod works at 90 strokes per minute. In spite of this heavy duty work the welded part has stood up.

Noise-Gard Sound Deadener

Introduction of a new product, known as the "Noise-Gard," has been announced by B. F. McDonald Co., Los Angeles. Developed to answer a long-felt need for sound deadeners which would reduce the intensity of heavy industrial noise without interfering with reception of normal sounds such as speech and warnings, this new product resembles a set of radio earphones. The two cups, however, are of soft, resilient rubber, but, unlike earphones, they entirely en-



close the ear. They are adjustable to the wearer's comfort merely by sliding the cups up or down on the headband. The portion of the headband which loops over the wearer's head is leather covered.

Laboratory tests show that the Noise-Gard effectively reduces unwanted sounds while permitting the wearer to hear clearly normal conversation, instructions and warnings. The Noise-Gard begins to perform at a sound frequency of 1024, and operates throughout the full range of the frequency scale from 1024 to 11,584, where sound intensities are almost intolerable. Reduction of sounds in this portion of the scale varies from 15 to 30 decibles.

The Noise-Gard may be worn with other safety devices such as hats, goggles, respirators or welding hoods.

Aluminum Welding Flux

"Flo-Well" No. 1, an improved free-flowing flux for the gas welding of aluminum and aluminum alloys, is now being manufactured by A. K. Mauk, Pittsburgh, Pa.

It is used to gas weld wrought, cast or high tensile aluminum and aluminum alloys, of any size or shape, wherever welding is possible. As a result of improved methods of manufacture, it will positively not solidify or deteriorate, and can be easily applied by inexperienced welders.

Flo-Well, which is being widely used by the aviation and other industries, is packaged in ¼-lb. to 25-lb. glass containers to protect the flux from moisture. It may also be purchased in ton lots. Free samples, and instructions for use of this flux, will be forwarded by the manufacturer upon request.

Navy Adopts Daynite Distress Signal

Outgrowth of wartime combat experience, the U. S. Navy had adopted a new hand-held distress signal made by Aerial Products, Inc. It is identified as Signal (Distress Day and Night) Mark 13 Mod. O.

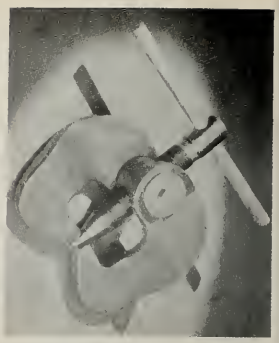
The new signal weighs less than 7 oz. and is only 5⅛" long and 1⅝" diameter, yet it provides a dense cloud of high visibility orange smoke by day and a brilliant 20,000 candlepower red flare at night. Automatic pull-ring ignition is used to set off either end of the signal. Double-wall construction keeps the signal cool in the hand during use.

Both the day-smoke and night-flare signal burn for 20 seconds and can be observed as far as the eye can see. If either signal is unobserved, the unused end remains available for use. Kits containing six signals will be furnished for non-military use.

As soon as basic peacetime requirements of the Armed Forces are provided, this improved distress signal will be available to merchant ships, yachtsmen, airlines, sportsman flyers, etc., under the trade name "A-P Daynite Distress Signal."

Aerial Products, Inc., is now establishing a network of distributors who will maintain stocks of these signals at strategic locations. An illustrated booklet is available from the manufacturer.





Flange-Jacks

A new tool that does a hard job the easy way is a good description of Flange-Jacks, manufactured by T. G. Persson of Bloomfield, New Jersey.

The job of opening flanges on pipe lines for gasket renewal, for which these jacks are specifically designed, can be done faster, easier, safer and more economically with the new tool, which has been tried and proved with outstanding success on countless difficult jobs.

The Flange-Jack replaces the old, slow, crude hammer-and-chisel way. It will open joints quickly even in cramped spaces, it protects flange faces against damage, and it will eliminate sparks from hammer and chisel blows as well as vibration in pipe lines.

Flanges are separated gradually and evenly without undue strain; bolt holes are maintained in perfect alignment for positioning gasket. Strong, sturdy and simple in design, Flange-Jacks are available in following sizes and types: Standard 2" to 20", inclusive, and for extra heavy flanges up to 12", inclusive. Larger jacks are made to order.

Paint Adhesion to Aluminum

Aluminum and its alloys can now be easily, quickly and economically prepared for painting and lacquering with a surface chemical solution distributed by Colonial Alloys Company, Philadelphia, Pa..

The application of this surface preparation can be done either in the shop as a hot immersion process, or

in the field as a cold spray, brush or immersion.

The hot immersion method consists of dipping the work for from three to 30 minutes in a hot chemical solution, rinsing and drying, after which it is ready for painting or lacquering.

The cold spray, brush or immersion method consists of applying a chemical solution (at room temperature) by spray, brush or immersion, allowing from 15 seconds to 1 minute for setting, then rinsing the surfaces free of the applied solution. The work is then dried and is ready for painting or lacquering.

Both methods are excellent for paint and lacquer adhesion, and should in many cases replace the sand-blasting or anodizing of aluminum surfaces. The hot immersion method is better for increasing the corrosion resistance of the aluminum, but the cold method also enhances the corrosion resistance.

The cold method is of special interest, since it can be applied to aluminum already assembled in the shipyard, or in place, as in light partitions or fittings aboard ship.

All-Purpose Electrode Holder

This new electrode holder, which offers many practical improvements in design to increase welding efficiency by 20 per cent, is designed and manufactured by Yarco, Los Angeles, Calif. It is fully insulated, and is known as the Garibay "350."

It is light in weight (17 ounces), simple and compact for ease in manipulation, and carries 350 amperes continuous conductivity. Offset jaws provide a full view of work at all times, making welding possible in places ordinarily inaccessible. It uses all the coated portion of the electrode. Bending of the rod and breaking the flux is never necessary. Full throat construction provides easy flow of electricity with a minimum of resistance. It is scientifically ventilated for cool handling, and is equipped with a mechanical cable connector, which does away with the slow solder method.

All-purpose electrode holder.
(Photo by Meriman Photo Art.)



New Collet Chuck

Redmer Air Devices Corporation announces the addition to its line of collet air chucks of a new model, to be known as the No. 4. This new chuck will have a collet capacity of 3½" and will use a special type 3½" master collet. Various size pads can be had to reduce the hole diameter to the desired size.

The No. 4 chuck now allows work up to 3½" to be held to the desired depth, as the parts can drop through the entire depth of the chuck. This is a decided advantage over the previous method whereby the depth was limited to the depth of the step of the collet.

The same principle is used as in the other four models, in that the collet remains stationary; the opening and closing controlled by the sleeve. By this method the depth of the work can be controlled even though there are variations in the diameter of the work to be held, as there is no up or down movement of the collet.

Metal Spray Booths

Ordinary spray booths designed for paint and similar materials do not solve all the problems created by strong blasts of air and metal from metallizing guns. These difficulties are now overcome with metallizing spray booths and dust collecting equipment. Designed, engineered and built for handling sprayed metal dust, a complete line has just been released by the Metallizing Engineering Company of Long Island City, New York.

The line includes spray booths for exhausting to present exhaust systems, to the atmosphere, or into a Metco wet collector. Featured in the line is a lathe exhaust unit that is mounted directly on the lathe carriage and moves with it. Also featured are wet collectors and water wash spray booths, which gather metal particles in a sludge sump, where valuable dust may be reclaimed for salvage.



Metco spray booths include advantages such as sloping rear wall, which eliminates eddies and recirculation; open type work table, down draft, dust trap and cleanout door.

Liquid Insulation

Liquid insulation, a new product widely used by the armed forces for water-proofing ignition systems and batteries of jeeps, tanks, trucks and various types of amphibious vehicles, was formally introduced to the public for the first time on May 15 by U. S. Industrial Chemicals, Inc., at a special press demonstration in New York.

Entirely different from any other type of water-proofing material, the new product is now available under the name of "PiB." It is a penetrant, which is absorbed into the material treated, rather than a coating.

Primarily designed for water-proofing the ignition systems and preventing corrosion of batteries in motor vehicles, PiB may be used for similar purposes in the farm, marine, aviation, industrial, electrical, mechancial, heating, household, communications and related fields.



Undersea Torch Lighter

Developed specially for the United States Navy by the JO Manufacturing Company of South Gate, California, the Diamond S underwater torch lighter, used in essential salvage and repair work on Government craft, is now commercially available. It was more than adequate in meeting naval requirements for a welding torch lighter that could be lit and relit by divers while under water.

The Diamond S lighter is connected to the air line and works on any air pressure from 30 to 120 pounds without electrical connections. When the diver wishes to light his torch, he places it against the lighter in the position indicated by the guide. (See picture for guide, which is the horseshoe shaped bar on top of the nozzle.) When the torch is in position for lighting, the pistol grip is squeezed, releasing the air which forms a protective envelope around the torch as a strong spark is shot out.

While the high chrome finish of the lighter enables the diver to see it more readily in the underwater gloom, the guide insures the correct placement of the torch even when water-darkened depths prevent clear vision.

The action of the undersea lighter is non-failing. It is designed with an understanding of the underwater conditions in which a diver must work. The heavy pistol grip is made to be used while wearing the thick gloves required when working under extreme water pressure. Ruggedly constructed of special alloys, all materials in the lighter are non-corrosive in both fresh and salt water.

Sealed Containers Prevent Corrosion

America's big guns and other heavy artillery equipment may be stored in hermetically-sealed containers instead of being scrapped. In cooperation with the Pittsburgh Ordnance District, methods and procedures for this storage program are being developed by United States Steel's American Bridge Company plant at Ambridge, Pa.

Extensive research and experiments have been under way for several months in a section of the expansive Ambridge plant facilities. A welded steel container closely resembling the Army Quonset Hut has been developed. The equipment, after being stowed in these sealed-in units, will be subjected to an inert gas atmosphere which, it is anticipated, will prevent deterioration of the contents over a long period of time. Equipment so preserved will be ready for use in the event of another Pearl Harbor. Under the plan now being worked out, reconditioned artillery pieces will be delivered to the Ambridge plant for "packaging" and ultimately shipped to designated storage locations. The containers are designed for storage almost anywhere under extreme temperatures ranging from 60 degrees below to 170 degrees above zero.

Should it come time to open the "cans" and use the guns again, a burner's torch would do the trick.

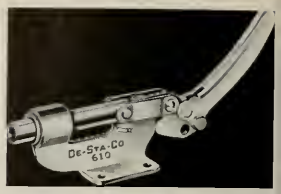
Dolfinite No. 2389

A non-fading deck head enamel, outstanding for its long wearing qualities, has been developed by The Dolphin Paint & Varnish Company, Toledo, Ohio, and is being marketed as No. 2389 Dolfinite.

Sun rays reflecting from the water, which are destructive to ordinary enamels, have no deteriorating effect on it. Further details and a copy of the new Dolfinite catalog on marine paints, finishes, seam and bedding compounds, waterproof cements and preservatives, may be had by addressing the manufacturer.

Lock Clamp for Heavy Duty

A growing practice during recent years is the use of the versatile toggle clamp as a medium for holding work securely in jigs or fixtures during various assembly and production operations. In step with this trend, a



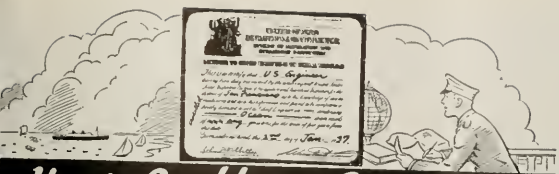
"Push-and-Pull Lock" type was introduced several months ago to serve in such operations as locating and indexing, and is now supplemented by a larger model for the heavier work involving the same production operations.

Known as the De-Sta-Co Model 610, this clamp can be quickly converted from "Push" to "Pull" action —or vice versa—in a few seconds, simply by relocating one of the handle bolts. Weighing but 1½ lbs. and with an over-all length of 6¾" ("Push" position) this heavy duty model has a plunger rod travel of 1½". Rod is tapped to receive a ⅜"-16 standard threaded bolt, providing quick adjustment to the work being handled. Its finish is a silvery-toned rust-resistant plating. De-Sta-Co clamps are manufactured by the Detroit Stamping Co., Detroit, Mich.

Facts You Should Know About Silbraz Joints

The Silbraz joint — the modern threadless connection that actually bonds I.P.S. copper tubing and brass pipe into a single "one-piece" pipe line—is thoroughly described in the new 16-page, 2-color booklet "How to Cash in on the Silver Ring," issued by Air Reduction Sales Co., New York, N. Y.

Profusely illustrated, the booklet shows how Silbraz joints are made from patented bronze pipe fittings, valves and flanges, containing a factory-inserted ring of silver brazing alloy in each port opening. The literature shows that when brass pipe or I.P.S. copper tubing is properly inserted in these fittings and the assembly is brazed, the resulting joint is stronger than the pipe itself . . . a joint that is leakproof; that will not creep or pull apart under any pressure which the pipe itself can withstand.



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Undercutting Commutators

A typical undercut, or sometimes lled slotted commutator, is familiar all engineers, and little or no ar- ument need be presented for its use. ush mica in commutators, that is, mmutators which are not undercut, es not long remain flush with the mmutator segments. Even with ft grades of mica, the latter is more sistant than copper to the wearing fects of commutation and mechani- l abrasion from the brushes. As on as the copper wears down far ough to allow the mica to pro- ude a few ten thousandths of an h, sparking results, burned bars, t slots, and even flashovers may low if the condition is not prop- y corrected. At one time in the st, brushes were made abrasive rposely to grind off the mica as it dually tended to protrude above copper, but it is difficult to find brush which will wear off the ca as fast as it does the copper, l such a method has never been isfactory.

Undercutting of the mica in commutators for dc machines came into use probably over 50 years ago on railroad motors and series type motors used in steel mills and heavy duty service. The resulting improvement and reduction in commutator maintenance have extended this practice of undercutting to practically all classes of service. Very low commutator speed or the presence of bad oil condition or some other special circumstance may occasionally make it preferable to operate a machine with flush mica, but such conditions are seldom encountered.

In the early days of rapid commutator wear associated with the brushes, the mica was often undercut as much as 3/32 or 1/8 of an inch to avoid the necessity of too frequent reslotting. These deep slots, and in many cases the continued use of abrasive and wax lubricated brushes, often resulted in armatures becoming short circuited by an accumulation of conducting dust in the slots. This was indicated by rings of fire or illumination around the running commutators, indicating a glow of carbonatious materials in the slots due to the voltage and close clearance. Another early source of commutator failure resulted in improper undercutting by using a hook-shaped tool for removing the mica. Mica is hard and brittle and dragging it out by means of a hook or scraper is almost certain to cause small checks and cracks in the mica in which dust, oil or moisture may finally become embedded and break down the insulation between segments.

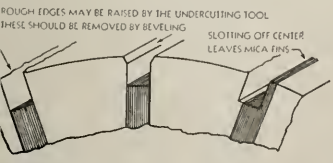


Fig. 1

e depth of U-shaped slots should not appreciably ceed the thickness of the mica. Bar edges should be beveled and all mica fins removed.

There are many tools more or less convenient which are available, some hand operated and some motor driven, for undercutting commutators. Where a great deal of this work is done, such as in a manufacturing shop, very efficient tools especially designed and built for this purpose are used. For doing this job manually a piece of hacksaw blade mounted in a suitable holder is often used for undercutting where the amount of work done does not justify the purchase of special equipment. Such a tool is satisfactory, provided a sharp blade which cuts the mica freely is used. If the blade is allowed to become dull, it tends to drag the mica from the slot and may be open to the same objection as the hook-shaped scraper previously mentioned. The hack saw blade should be secured in a suitable handle and it may be necessary to reduce the width of the blade by grinding the edges of the teeth along the side of the blade.

There are two general types of motor-driven tools, one a device which causes a tool similar to a file to oscillate rapidly back and forth. This is placed in the slot while the motor drives it back and forth through a short stroke. Another type of tool drives a rotary cutter similar to a milling machine disk cutter and, therefore, is driven by a flexible shaft from a motor. Suitable guides for location and depth are provided.

Before beginning the work of undercutting, the commutator surface should be turned, ground or stoned, as discussed in previous issues. All grooves, ridges and eccentricities, also flat spots and other surface faults, should be eliminated, and except for final polish a true cylindrical surface established. No lubricant of any

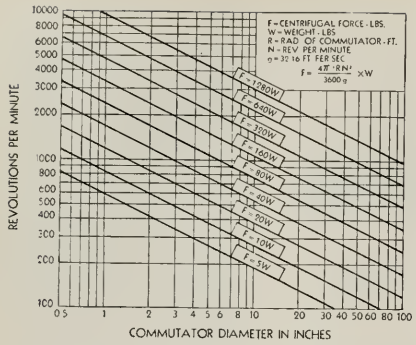


Fig. 2

Lines of equal centrifugal effect for commutators of various diameters and speeds.

kind should be used in undercutting, and lubricant should not be applied to a commutator that has been undercut. The presence of oil or grease may result in an accumulation of carbon or copper dust in the slot, causing short circuit between the bars and damage to the armature coils. For a similar reason artificially lubricated brushes from which any oil or wax may be driven in the course of operation should not be used on a slotted commutator. Where oil may creep in from the bearings or where the machine operates in a moist, oily or dirty location, it is often advantageous, after slotting, to coat the slot with a good air-drying insulating varnish. After this is thoroughly dry it should be removed from the outer surface of the commutator with sandpaper or commutator stone.

There has been a great deal of discussion over the question of the preferable shape of the slots to use. The square bottom or U-shaped slot shown in Fig. 1 has the advantage when the work is carefully done of being effective until the commutator has worn down the full depth of the undercut. Since non-abrasive brushes are now used almost exclusively, the need for frequent reslotting is avoided. However, accumulated dust is not thrown out from the U-shaped slot by the action of centrifugal force as greatly as it is from the V-shaped slot. It is best not to cut U-shaped slots deeper than 1/32" or at the most 3/64" for mica of average thickness. Attempts have been made to define the recommendable slot depth in terms of peripheral speed of the commutator, but this is impracticable. The centrifugal force on dust particles at the surface of a 4 ft. commutator at a peripheral or commutator speed of 5000 ft. per minute is no greater than that on a particle of the same mass on a 1 ft. commutator at 2500 ft. per minute peripheral speed.

Figure 2 shows the revolutions per minute at which commutators of various diameters exert equal centrifugal force on particles of equal mass. Lines are drawn for values of centrifugal force ranging from 5 to 1280 times the weight of the particle added. The force required to throw particles from the slot is dependent upon several factors such as width of slot, roughness of sides of the slot and abrasive properties of the dust particles which tend to deposit. It is, therefore, impossible to state with assurance the conditions under which commutator slots will or will not keep free from deposits. Experience has shown that slots 1/36" deep in 0.030" mica will keep free from a deposit of dry dust if the centrifugal force is at least 40 times the weight of the particles. Slots 3/64" deep may require a value of force equal to twice this amount.

If the tool with which the undercutting of the U-shaped slot is made should drag or tear the copper, leaving sharp grooves and jagged edges this also has the effect of cold-drawing on the side of the bar, which causes a hardening of the copper at that point. This is particularly the case with the rotary cutter. No matter how carefully the surface of the commutator may be smoothed or polished after slotting, there is a knife edge of hardened copper at the edge of each bar. This hardened edge will not wear down uniformly with the soft center of the bar, and after a time will have a tendency to cause the bar edges to act as scrapers along the brush face. It is, therefore, always advisable to bevel the edge of the commutator bars as indicated in Fig. 1. A beveled face of about 1/64" is usually sufficient to remove roughness or edge hardening. A slotting file or thin V-shaped section or scraper (Fig. 3) is an effective tool for beveling these bars. It i

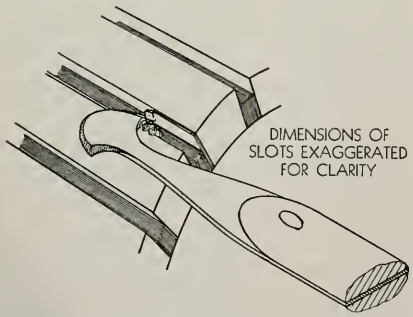
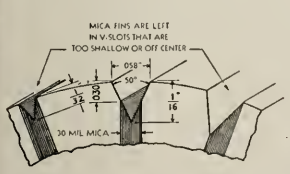


Fig. 3

After undercutting, mica fins can be removed and bar edges chamfered in one operation.

also highly important to see that no fins of mica are left along the side of the slot. Frequently the undercutting tool does not follow the line of the mica perfectly, leaving thin edges of uncut mica in the slot. This condition is sometimes referred to as feather-edge mica. These mica fins may prove almost as troublesome as an unslotted commutator. Therefore, in undercutting, every slot should be closely inspected and all mica fins smoothed with a knife blade or tool, as shown in Fig. 3.

V-shaped slots shown in Fig. 4 are usually cut with a slotting file or a properly shaped rotary cutter. These cutters are available in 40, 50 and 60 deg. angles. The 40 deg. cutter is generally preferred for thin mica and the larger angle for thick mica. A cut of 1/16" deep and accurately centered on the mica will leave 1/32" free copper above the mica, if the 40 deg. cutter is used on 0.023" mica. It is, of course, very important to keep the cutter accurately centered on the mica. Figure 3 is a typical example showing a departure of less than 1/64" from the center line of the mica. Mica fins in V-slots, being wedge-shaped, are more difficult to remove than the fins of uniform thickness left in the sides of U-shaped slots by inaccurate centering of the cutter. However, the fact that V-shaped slots keep free from deposits at very low speeds and do not require a separate operation for beveling of the bar edges causes this



V-shaped slots keep free from deposit at low speed and leave beveled edge on commutator bars but require accurate centering.

Fig. 4

Fig. 5



"Arc" undercutting has a limited field of application.

form of slot to be preferred by many.

A form of slot sometimes described as arc undercutting, Fig. 5, has a limited application on machines which will not operate satisfactorily when slotted by other methods. In this case the total width of the slot at the top should not be more than 3½ times the thickness of the mica and less than 2½ times the thickness of the mica. The cut should be about 0.010" deep.

After the commutator has been undercut and inspected for mica fins the surface should be lightly polished with sandpaper or stone, as discussed in previous articles. It is good practice to burnish surface with hard wood blocks in the manner previously discussed.

As mentioned heretofore, the undercutting eliminates the necessity for abrasive brushes. However, some types of machines and some conditions of service require a certain amount of polishing action on the part of the brushes to maintain commutator surface in proper condition. Natural graphite brushes are sometimes used, as many grades of this type possess a mild abrasive characteristic which enables them to maintain a good commutator polish under decidedly adverse conditions, but, of course, with more commutator wear and grooving than is experienced with properly selected grades of electro-graphitic brushes. Electrographitic brushes as a rule are non-abrasive and cause less commutator wear than any other type of brush. They have low friction and exceptionally good commutating properties. In addition to the usual non-abrasive electro-graphitic brush, grades are now available which have a mild polishing action which is not severe enough to cause appreciable commutator wear, but does assist in maintaining a clean well-polished surface where gas or other commutator poison such as acid fumes or oil vapors tend to develop trouble from surface film. There are also grades of definite film-forming properties. These latter are entirely non-abrasive and are used to develop a graphitic surface film under light loads or adverse conditions.

In conclusion, it can be stated that careful preparation of the commutator by grinding or stoning, a good job of undercutting by a final light stoning and burnishing, and the application of brushes of the proper grade can usually be depended upon to eliminate the need for frequent reconditioning of the commutator surface. A little extra time and care in the initial preparation of the commutator will be well repaid by the improved performance obtained and the resulting reduction in future maintenance.

Restrictions Lifted On Sisal Rope

Rope-starved users will welcome the news that all restrictions governing the sale of Sisal rope have now been lifted. According to an announcement by W. I. Atherton, general sales manager of Tubbs Cordage Company, Sisal rope may now be purchased for every purpose, without priority.

"While our mills in San Francisco and Seattle are still limited as to the amount of Sisal rope we are permitted to manufacture," Mr. Atherton states, "all individual industry quotas and end use restrictions have been withdrawn and we hope that within a very short time we will be able to supply our Victory Brand No. 1 Sisal Rope to fill every need."

Present restrictions, however, will continue in full force during the fourth quarter on Manila rope as well as on the use of hard fiber in the manufacture of wrapping twine.

Since Pearl Harbor, the rope industry has been devoting its entire efforts toward supplying the armed forces, and the lifting of the restrictions on Sisal rope marks the first step on the road toward normal peacetime operation.

New Merchant Marine Cadet Course

Effective on September 15, the course of training for Cadet Midshipmen in the U. S. Merchant Marine Cadet Corps reverts back to the pre-war term of four years, it was announced by Lt. Comdr. E. G. McDonald, District Cadet-Midshipmen Supervisor for San Francisco.

The four-year term will include 12 months of basic training at the Cadet School at San Mateo; one year at sea and two years at the Cadet Academy, King's Point, N. Y.

Instead of graduating as licensed 3d mates or 3d assistant engineers, as they have in the past, successful candidates will qualify for 2nd mate and 2nd assistant engineer licenses.



Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

Reemployment Rights for Members of the Merchant Marine and the United States Maritime Service

Part II

The Act is mandatory insofar as the Federal Government, its territories and possessions, and the District of Columbia, are concerned. Subdivision (A) of Section 2 of the Act provides that, "if such position was in the employ of the United States Government, its Territories or possessions, or the District of Columbia, such person shall be restored to such position or to a position of like seniority, status, and pay."

Private employers, unless the employer's circumstances have so changed as to make it impossible, or unreasonable to do so, can be forced to reemploy such persons, and procedure has been set up in the Act whereby the various United States Attorneys, and the United States District Courts are to step in—without cost to the applicant—and institute action to force these private employers to restore these discharged members of the Merchant Marine and the United States Maritime Service to their old positions. Several such actions have already been instituted and it is anticipated that a great many more will be commenced. Up to the present time at least, action of United States Attorneys has been lukewarm in instituting such suits, and the following letter of instructions issued by the United States Attorney General to all United States Attorneys as of May 10, 1945, will show the reason for this:

Enforcement Role of United States Attorneys

To All United States Attorneys:

"United States Attorneys have been previously advised (Criminal Division Bulletin of March 10, 1945), that the functions of the Department with reference to reemployment cases under Section 8 of the Selective Training and Service Act of 1940, as amended (the reemployment provisions for members of the Merchant Marine and the United States Maritime Service are identical with the provisions of this Act), 50 USC 308, have been transferred from the Criminal Division to the Claims Division.

"Recent developments indicate that there will be a fairly substantial number of cases involving controversial points. In view of the Congressional purpose to protect veterans and of the obligation imposed on United States Attorneys under Section 8 of the Act, it is the position of the Department that a veteran is entitled to representation whenever there is a reasonable basis for assertion of a right to the benefits of the Act. However, since veterans throughout the country will be asserting reinstatement rights in parallel situations, it is highly important that a uniform policy be established and maintained in handling cases of this type.

"In order to facilitate formulation of such uniform policy and adherence thereto, United States Attorneys should promptly refer to the Department all reemployment cases involving any doubtful questions before instituting or refusing to institute an action on behalf of the veteran.

"Since many important questions may arise in suits in which the veteran retains private counsel, United States Attorneys should request the Clerks of their District Courts to advise them of any cases filed under Section 8 by private counsel, and should advise the Department of any such suits.

"From time to time, as specific issues arise about which there may be any doubt, supplemental circulars will be prepared and forwarded.

"In situations of a reduction in force, an employer may be able to reinstate a veteran only by dismissing a non-veteran with greater seniority. The Selective Service System and others maintain that Section 8 requires actual restoration to the former job, regardless of relative seniority, even if such restoration necessitates such dismissal. **(Note:** A recent case in point was decided on August 30, 1945, in the United States District Court in the State of New York, wherein Federal Judge Matthew T. Abruzzo ruled in the matter of Fishgold v. Sullivan Dry Dock Company that 'a World War II veteran is entitled to the job he held before entering service, even though his rehiring may necessitate dismissal of a worker whose seniority is greater.')

"The Department will represent veterans asserting such 'superseniority' resoration claims. Moreover, we will present to the Court the corollary proposition that, in the event of lay-offs, within the one-year period following restoration, the veteran is entitled to retain his position even if it results in the lay-off of a non-veteran with greater seniority. (This approach amounts to a contention that a veteran is entitled to job restoration and retention, regardless of seniority, as long as the work is being done by any non-veteran.) **However, since the 'superseniority' interpretation is not free from doubt under the Act, the Department will**

expect to present the issue to the Court with full candor. Any briefs submitted will disclose the considerations and the legislative history both pro and con. The duty of the United States Attorney is not only to represent the veteran, as provided by the Statute, but acting as an officer of the Court, to present to the Court whatever may be useful in helping the Court arrive at a proper construction of the Statute.

"Any veteran seeking representation in asserting a superseniority claim should be informed of the fact that his case will be presented in this manner so that he can retain private counsel should he desire to do so.

"While the general outline of the procedure to be taken on the foregoing issue has thus been established, it has not been precisely formulated in its application to the varying fact situations which will arise. For the time being, therefore, all cases involving questions of seniority should be immediately referred to the Department before any action is taken beyond exploration of the issues involved.

"United States Attorneys should also refer to the Department all cases involving the effect on restoration rights of closed shop contracts or other analogous restrictive agreements before taking action beyond exploration of the issues involved."

Following is the text of the Reemployment Act for members of the Merchant Marine and the United States Maritime Service. The text of the Act itself is in bold-face type. Explanation, if any, of each provision of the Act immediately follows the Act.

Reemployment Rights — Merchant Marine—Maritime Service. Chapter 142, Public Law 87. Approved June 23, 1943.

Sec. 1. When used in this Act the term "Service in the Merchant Marine" means service as an officer or member of the crew or in connection with a vessel documented under the laws of the United States or a vessel owned by, chartered to, or operated by or for the account or use of the administrator, as an enrollee in the United States Maritime Service on active duty, and, to such extent as the administrator shall prescribe, any period awaiting assignment to such service and any period of education or training for such service in any school or institution under the jurisdiction of the administrator. Any person entering service in the Merchant Marine after May 1, 1940, and before the termination of the unlimited National emergency declared by the President on May 27, 1941, who, in accordance with rules and regulations prescribed by the administrator, War Shipping Administration, completes a period of substantially continuous service in the Merchant Marine, shall be entitled to a certificate to that effect from the administrator upon completion of such period, which shall include a record of any special proficiency or merit obtained.

War Shipping Administration, General Order 44, CFR., Title 46—Shipping—Chapter III. Issued May 17, 1944, 9 FR 5315.

The following rules and regulations are prescribed by the Administrator, War Shipping Administration, as necessary or appropriate to carry out the provisions of Public Law 87, Seventy-eighth Congress, Approved June 23, 1943 (57 Stat. 162).

Definitions

As used herein (a) Administrator means the Administrator of the War Shipping Administration.

(b) "Recruitment and Manning Organization" means the Recruitment and Manning Organization of the War Shipping Administration.

(c) "Training Organization" means the Training Organization of the War Shipping Administration.

(d) "Vessel" means any vessel documented under the laws of the United States, and any vessel owned by, chartered to, or operated by or for the account or use of the Administrator.

(e) "Seaman" means any person who has entered service in the Merchant Marine after May 1, 1940, and before the termination of the unlimited national emergency declared by the President on May 27, 1941.

(f) "Service in the Merchant Marine" means any service:

(1) As an officer or member of the crew on or in connection with a vessel; or

(2) As an enrollee in the United States Maritime Service on active duty, as heretofore defined by the rules and regulations of the Administrator; or

(3) As an enrollee or student in any school or institution, including the United States Merchant Marine Cadet Corps and any State Maritime Academy, under the jurisdiction or supervision of the Administrator; or

(4) As a person awaiting assignment for service, as defined above, to the extent that such period is established to the satisfaction of the Recruitment and Manning Organization or the Training Organization, as the case may be; or

(5) In any combination of the foregoing.

Substantially Continuous Service

The service of any seaman in the merchant marine shall be deemed to have been "substantially continuous" if such seaman continues in such service 75 per cent or more of the time elapsing between the date upon which he entered such service and the completion of his period of substantially continuous service as defined in the following section:

PROVIDED, That any such seaman shall be credited with service in the merchant marine: (a) for any time during which he may be disabled for active employment in such service as the result of illness or injury not caused by his own willful misconduct; (b) for any time required for his repatriation following his separation from the vessel for any cause, not due to his own neglect or misconduct (not including time consumed in delay resulting from his refusal to be repatriated); (c) for any period of service aboard a public vessel; and (d) for the period between the submission of his application for a certificate under these rules and regulations and the issuance of such certificate.

Completion of Period

A seaman shall be deemed to have completed a period of substantially continuous service in the merchant marine upon the issuance of a certificate to that effect by the Administrator.

(To be continued)

On the Ways—

SHIPS IN THE MAKING

Standard Oil Honored at Sun

The turbo-electric tanker J. H. MacGaregill was launched in the Sun Shipbuilding and Drydock Co., yard October 6. The sponsor was Mrs. J. H. MacGaregill after whose husband the ship is named. He is a vice president of the Standard Oil Company of California, and guests from the Pacific Coast, Washington, and elsewhere were present at the ceremony.

The SS J. H. MacGaregill is the third ship launched this year to be named after an official of the Standard Oil Company of California. The other two were the SS J. L. Hanna, which was launched on August 21, and the SS H. D. Collier, which was launched on September 19.





At left: A moment after this picture was taken, the SS H. D. Collier was launched at Sun Shipyard, Chester, Penn. The sponsor was Mrs. H. D. Collier, wife of the president of the Standard Oil Company of California also shown at left. John G. Pew, president of Sun, is giving last minute instructions.

●

Below, left: John A. McCone, president of the California Shipbuilding Corporation, driving the final rivet into the SS Council Bluffs Victory, hull No. 467 and last to be launched at Calship. A good-humored crowd of workers cheered for McCone as the rivet was hammered into place.

●

At battam: Mr. and Mrs. J. H. MacGaregill with John G. Pew, president of Sun. Mrs. MacGaregill launched a Sun ship named for her husband, who is vice president of the Standard Oil Company of California.



New Tanker Contract

Bids for the construction of four tankers for National Bulk Carriers, Inc., New York, will be opened at the offices of the U. S. Maritime Commission November 13, 1945. A ceiling of $1,800,000 per vessel has been placed for bids the Commission will consider.

The tankers to be built will be 440-foot, single screw, geared turbine-drive vessels of the Maritime Commission's T2-S-BQ1 design. Each will be 13,500 dwt and capable of transporting 114,000 barrels of oil. The 6600 hp of their engines will give a speed of 15 knots.

Assistance in financing the construction of the four tankers has been voted by the Commission in accordance with section 509, Merchant Marine Act of 1936.

National Bulk Carriers states the new tankers are for use in the company's U. S. Gulf and coastwise, as well as world-wide petroleum trade, and are intended to round out its fleet to meet more adequately charterers' requirements.

Forms for bids may be obtained from the Secretary of the U. S. Maritime Commission, Washington 25, D. C.







CHRISTENING PARTY OF THE SS VICTORY LOAN

The sponsoring committee at the Victory Loan launched on October 6 at Swan Island yard of the Kaiser Co., Inc. L. to r: E. C. Sammons, Oregon war finance committee chairman; Ted Gamble, national director of war bond sales for the U. S. Treasury; Mrs. Fred Vinson, wife of the Secretary of the Treasury, sponsor, and E. R. Neiman, general manager for the shipyard, at Portland, Oregon.

At right: ON THE NOSE. As everyone grimaces and ducks the SS Victory Loan is christened by Mrs. Fred Vinson.

Below, right: A crowd of 5000 swarmed to the launching platform of the Victory Loan as she awaits the smashing of champagne on her bow at the ways of the Swan Island shipyard.

New Dock at Bethlehem

In order to further increase its docking and repair facilities, Bethlehem Steel Company's San Francisco Yard has acquired a new floating drydock, the YFD-70, which it will operate for the Navy and which already has serviced two vessels, one a merchant vessel in for damage survey, and the other, a new type United Fruit ship, for survey and painting.

The YFD-70, one of four of its type, has a rated lifting capacity under full operating conditions of 14,000 long tons, and will accommodate all types of destroyers and submarines and certain types of Maritime Commission ships and cruisers.

The overall length of the floating drydock is 598 feet. It has a total weight of 5900 long tons, and is equipped with four pumps, each with a capacity of 29,000 gallons per minute. Flooding time with a 14,000-ton ship is only 35 minutes.

By putting into operation the new drydock, other docking facilities now employed in the yard for Navy work may be released for servicing ships of the cargo and passenger types.

Union Plant Launches Destroyer

The USS Lloyd Thomas, 2200-ton destroyer named for a 30-year old Navy flier missing in action since the Battle of Midway, was launched at the Bethlehem's San Francisco Yard October 5. The vessel, 51st combatant vessel to be built at the yard during the recent war period, was sponsored by Mrs. Lloyd Thomas of Coronado, California, widow of the man for whom the ship was named. This was the first vessel to be launched at this yard for the Navy after V-J Day.

Swan Island's Tanker Swan Song

Swan Island shipyard in Portland, Oregon, one of the three Kaiser Oregon-Washington wartime yards, launched its last three tankers in October, completing the Maritime Commission contract. These vessels were the Victory Loan, originally slated to be christened the SS Sutter's Fort, which went into the water October 6; the Coxcomb Hill, launched October 20; and the SS Bent's Fort, which slid down the ways on October 27.



A DRAVO TOWBOAT

Towboat Lehigh hits the Ohio River at Neville Island plant of Dravo Corporation on October 3. The towboat will enter the river service of the Union Barge Line and because her engines will be supercharged and the boat equipped with Kort nozzles, it is expected that the boat will actually have a thrust equal to that usually obtained from 2400 hp boats of conventional design.

Towboat *Lehigh* Launched

The 2000 hp river towboat Lehigh was launched at Dravo Corporation's Neville Island plant on October 3, with Mrs. Alfred S. Osbourne of Trotwood Acres, Pittsburgh, Pennsylvania, as sponsor. Mrs. Osbourne is the wife of Alfred S. Osbourne, executive vice president of Union Barge Lines.

The 176-foot Lehigh is powered by two Superior 4-cycle, 8 cylinder diesel engines, the complete power plant being rated at 2000 hp at 275 rpm. However, the engines are supercharged and the craft equipped with Dravo kort nozzles, so the Lehigh actually has a thrust approximately equal to that usually obtained from 2400 hp boats of conventional design.

The Lehigh has accommodations for a crew of 31 and will handle general merchandise in the service of the Union Barge Line.

OPPOSITE PAGE:

VICTORY YARD

California Shipbuilding Corporation, Terminal Island, California, grew from a swampland to the second largest emergency shipyard in America. We proudly present Calship . . . from the air . . . so that you can see a giant industrial city, on invisible stilts, taken when the yard was at peak production. This yard, in four years' time, has built 467 ships. The last to leave the ways was the SS Council Bluffs Victory, and the wife of California's Governor, Mrs. Earl Warren, was the Victory's sponsor.

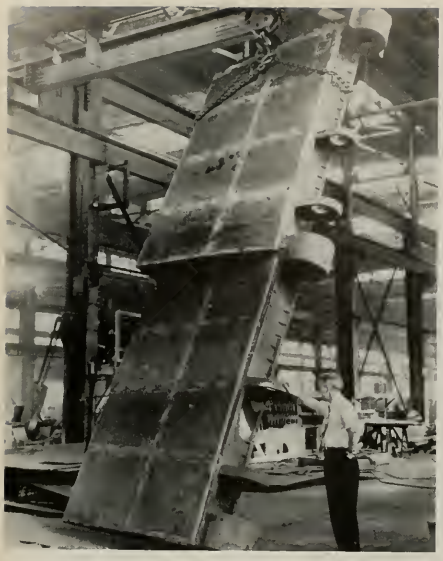
Four Transports Delivered During Month's Record

Sixty-seven vessels, four of them transports, were delivered by merchant shipyards during September, the U. S. Maritime Commission announced. The 67 ships totaled 612,471 deadweight tons.

West Coast shipyards delivered 28 ships, eight more than were turned out by the East Coast. The 28 ships had a total d.w. of 250,580 or 40.9 per cent of the tonnage. The 20 ships built in East Coast yards were of 203,084 d.w. tons or 33.2 per cent of the total. Gulf Coast yards produced 17 vessels of 148,787 d.w.t. for 24.3 per cent of the tonnage. Yards in the Great Lakes area delivered two coastal cargo vessels of 10,020 d.w.t. which was 1.6 per cent of the tonnage.

Ships delivered from U. S. Maritime Commission shipyards during September follow:

Shipyard	Number	Type
Alabama Dry Dock & Shipbuilding Co.	2	T2 Tanker
Bethlehem-Alameda Shipyard, Inc.	1	P2 Transport
Bethlehem-Fairfield Shipyard, Inc.	8	Victory Cargo
Bethlehem-Sparrows Point Shipyard, Inc.	1	C3 Cargo
California Shipbuilding Corp.	5	Victory Cargo
Consolidated Steel Corp., Wilmington, Calif.	7	C1-M-AV1 Coastal Cargo
Consolidated Steel Corp., Ltd., Craig Yard, Long Beach, Calif.	2	C1-M-AV1 Coastal Cargo
Delta Shipbuilding Co., Inc.	3	Liberty Colliers
Federal Shipbuilding & Dry Dock Co.	1	C3 Cargo
Froemming Brothers, Inc.	1	C1-M-AV1 Coastal Cargo
Globe Shipbuilding Co.	1	C1-M-AV1 Coastal Cargo
Gulf Shipbuilding Corp.	1	Refrigerated Cargo
The Ingalls Shipbuilding Corp.	2	C3 Cargo
J. A. Jones Construction Co., Inc., Brunswick, Ga.	3	C1-M-AV1 Coastal Cargo
J. A. Jones Construction Co., Inc., Panama City, Fla.	2	Modified Liberty Cargo
	1	T1 Coastal Tanker
Kaiser Cargo, Inc., Richmond Shipyard No. 4, Richmond, Calif.	2	C1-M-AV1 Cargo
Kaiser Co., Inc., Richmond Shipyard No. 3, Richmond, Calif.	1	C4 Transport
Kaiser Co., Inc., Swan Island Yard, Portland 8, Ore.	2	T2 Tanker
Kaiser Co., Inc., Vancouver, Wash.	2	C4 Transport
Marinship Corp., Sausalito, Calif.	2	T2 Tanker
McCloskey & Co., Tampa, Fla.	1	N3 Coastal Cargo
New England Shipbuilding Corp., South Portland, Maine	2	Modified Liberty Cargo
North Carolina Shipbuilding Co.	2	C2 Cargo
Oregon Shipbuilding Corp., Portland, Ore.	1	Victory Cargo
Pennsylvania Shipyards, Inc., Beaumant, Texas	3	C1-M-AV1 Coastal Cargo
Permanente Metals Corp., Shipyard No. 1, Richmond, Calif.	1	Victory Cargo
Permanente Metals Corp., Shipyard No. 2, Richmond, Calif.	1	Victory Cargo
Southeastern Shipbuilding Corp., Savannah, Ga.	1	C1-M-AV1 Coastal Cargo
St. Johns River Shipbuilding Corp., Jacksonville, Fla.	1	Naval Coastal Tanker
Sun Shipbuilding & Dry Dock Co.	1	T2 Tanker
	1	C4 Cargo
Todd-Houston Shipbuilding Corp.	1	T1 Coastal Tanker
Western Pipe & Steel Co.	1	C3 Cargo



RUDDER FOR 350-MILE ASSEMBLY LINE

This 11-ton rudder was completed at the Birmingham plant of the Ingalls Iron Works Company for shipment by rail to the Ingalls Shipyard at Pascagoula, Miss., 350 miles from the Alabama city. Eighty per cent, by weight, of the steel used by the shipyard is fabricated and assembled into units weighing up to 30,000 lbs. for shipment by trailer or flatcar from Birmingham.

Last of Ships Built by Marinship

To the tanker Mission San Francisco went the honor of being the 93rd and last ship built by Marinship. More than 5000 workers and their families, men and women who played an important part in winning the war, watched the big oil carrier slide into the Bay. They also realized that this marked finis to their building efforts for the greatest program of ship building in the history of the world.

President Kenneth Bechtel of Marinship expressed the sentiment with "The best of our spirit and ability has gone into this work. This proves again that the spirit of free men can rise to any emergency."

Marinship's war-built tonnage was 15 Liberty ships, 16 Navy oilers, 34 Hill Class tankers and 28 Mission Class tankers. Marinship was built by these workers at a cost of $17,000,000 and in record time.

Mass Ship Disarming

War Shipping Administration officials announces that an average of 50 vessels a day are being disarmed in the nation's shipyards. It is estimated that more than 10,000 guns on troop and cargo carriers with 3, 4, or 5-inch calibre, few of which can be earmarked as obsolete, must be removed from the vessels and stored for future emergencies. In addition, an arsenal of small arms must be removed from the ships and stored. The jobs are being handled on a contract basis, paid by W.S.A.

No. 2 Ship in Destroyer Division No. 128

The USS John W. Thomason, newest type Navy destroyer, destined to be No. 2 ship in Destroyer Division No. 128, was commissioned on October 11, 1945, at Bethlehem Steel Company's San Francisco Yard.

Capt. E. J. Moran, USN, of San Francisco, representing the Commandant of the 12th Naval District, accepted the ship on behalf of the Commandant and turned it over to its new Commanding Officer, Comdr. W. L. Tagg, USN, of Coronado, California. Capt. M. T. Dayton, USN, of La Jolla, California, Commander of Destroyer Division 128, was present at the ceremonies and on board during the ship's shakedown cruise.

The 2200-ton short hull destroyer is first of a class of such vessels with twin-mount 5" guns. It is equipped with latest radio and radar equipment and has triple the fire power of earlier types.

American Merchant Vessels Sunk in Pacific

The following is an official list (published by U.S.M.C. October 14) of the merchant vessels sunk by enemy action in the Pacific Ocean from Pearl Harbor to V-J Day, together with the name of firm operating each vessel for War Shipping Administration. It will be noted that the majority are Liberty-type ships. Only vessels completely lost are listed:

SS LEWIS L. DYCHE, Interocean Steamship Corporation, San Francisco.

SS JOHN BURKE, Northland Transportation Co., Seattle, Wash.

SS JAMES H. BREASTED, American President Lines, Ltd., San Francisco.

SS HOBART BAKER, General Steamship Corporation, San Francisco.

SS FRANCISCO MORAZAN, Isthmian Steamship Co., New York City.

SS WILLIAM SHARON, United Fruit Co., New York City.

SS JUAN DE FUCA, Navy.

SS JOHN M. CLAYTON, Navy.

SS JEAN NICOLET, Oliver J. Olson & Co., San Francisco.

SS RICHARD HOVEY, Sprague Steamship Co., Boston, Mass.

SS HENRY KNOX, Matson Navigation Co., San Francisco.

SS JOHN A. JOHNSON. American Mail Line, Ltd., Seattle, Wash.

SS ANTOINE SAUGRAIN, Agwilines, Inc., New York City.

SS CAPE GREIG, McCormick SS Div., Pope & Talbot, Inc., San Francisco.

SS THOMAS NELSON, Calmar Steamship Corporation, New York City.

SS MATTHEW P. DEADY, American-Hawaiian Steamship Co., San Francisco.

SS WATSON C. SQUIRE, Weyerhaeuser Steamship Co., Newark, New Jersey.

SS ALEXANDER MAJORS, Isthmian Steamship Co., New York City.

SS MARCUS DALY, Sudden and Christenson, Inc., San Francisco.

SS LEONIDAS MERRITT, United States Lines Co., New York City.

SS JEREMIAH H. DAILY, American South African Line, Inc., New York City.

SS DAVID DUDLEY FIELD,

Isthmian Steamship Co., New York City.

SS AUGUSTUS THOMAS, Coastwise (Pacific Far East) Line, San Francisco.

SS BENJAMIN IDE WHEELER, American-Hawaiian Steamship Co., San Francisco.

SS CAPE ROMANO, Lykes Bros. Steamship Co., Inc., New Orleans, Louisiana.

SS ALCOA PIONEER, Alcoa Steamship Co., Inc., New York City.

SS WILLIAM WILLIAMS, Navy Department.

SS NATHANIEL CURRIER, R. A. Nicol & Co., Inc., New York City.

SS H. M. STOREY, Standard Oil Company of Cal (TCA), San Francisco.

SS JOHN H. COUCH, Weyerhaeuser Steamship Co., Newark, N. J.

SS ADMIRAL HALSTEAD, Pacific Mail Steamship Co., San Francisco.

SS COAST FARMER, Coastwise (PFE) Line (TCA). San Francisco.

SS GUS W. DARNELL, J. H. Winchester & Co., Inc., New York City.

SS OTIS SKINNER, American-Hawaiian Steamship Co., San Francisco.

SS MORRISON R. WAITE, Coastwise (Pacific Far East) Line, San Francisco.

SS WILLIAM S. LADD, Weyerhaeuser Steamship Co., Newark, N. J.

SS EDWARD N. WESTCOTT, Agwilines, Inc., New York City.

SS GILBERT STUART, American Mail Line, Ltd., Seattle, Wash.

SS MARY A. LIVERMORE, Isthmian Steamship Co., New York City.

SS HOBBS VICTORY, Sudden and Christenson, Inc., San Francisco.

SS LOGAN VICTORY, American-Hawaiian Steamship Co., San Francisco.

SS CANADA VICTORY, Alaska Steamship Company, Seattle, Wash.

SS BROWN VICTORY, Alaska Packers Assn., San Francisco.

SS UNITED VICTORY, American President Lines, Ltd., San Francisco.

Brazilian Official Inspects Ingalls



At top: Captain Mario Celestino (front, center), president of the Brazilian Merchant Marine Commission and director of Brazil's nationally-owned Lloyd Brasileiro steamship lines, is shown aboard an Ingalls ship while inspecting the yard. L to r: W. R. Guest, the yard executive vice president; Captain E. E. Brady, U. S. Navy advisor to the Brazilian Commission; Captain Celestino and Monro B. Lanier, Ingalls president.

SOUTH AMERICAN HONORED AT LAUNCHING. Senhora Natalia Flores Celestina (with bouquet) launched the SS Sea Stallion, at Ingalls yard during the tour. L to r: L. R. Sanford, director of construction for the U. S. Maritime Commission; L. C. Montgomery, of New Orleans; Mrs. Sanford; Captain E. E. Brady, U. S. Navy advisor to the Brazilian Merchant Marine Commission; Mrs. Montgomery; R. I. Ingalls, Jr.; Senhora Celestino; Monroe B. Lanier; and Captain Mario Celestino, president of Brazilian Commission and director of Lloyd Brasileiro.

Daughter of U. S. Lines Treasurer Sponsored the Whistler

The S.S. Whistler was launched at North Carolina Shipbuilding & Dry Dock Company for the United States Lines, on October 6. The sponsor was Miss Janet Carol Gibbons, 12-year-old daughter of C. D. Gibbons, treasurer of the United States Lines. The new vessel is like several others of a fleet of 19 modified C-2 design ships being built for U. S. Lines. These ships are named for American clipper ships of the last century.

When completed the Whistler will join the company's Far East-Australia service, the American Pioneer Line.

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
MARINE UNDERWRITERS
200 BUSH STREET . . . . . SAN FRANCISCO
Offices at: Colman Bldg., Seattle • 111 West 7th St., Las Angeles

WAR'S IMPACT ON BRITISH SHIPYARDS

(Continued from page 645)

Trends

There is little doubt that, in coming years, the trend will continue towards the greater adoption of preconstruction under cover in the shipyards, and the installation of heavier cranes. Opinions as to the maximum economic size of prefabricated units vary, however, between 10 and 30 tons.

As to welding, it is generally believed that the process has still some way to go before it can show a decided advantage on economic grounds where there is much structural work, though for an increasing range of purposes its superiority is unquestioned. The importance of specifically designing structural parts for welding rather than adopting riveted designs is fully realized, and it may be said that among builders—if not among shipowners and their superintendents — prejudice against welding on technical grounds has disappeared with improved welding technique and procedure.

The majority opinion in favor of high-amperage A.C. plant is still hotly contested by at least one advocate of D.C. supply: a British shipbuilding firm with many years' experience as pioneers of welding.

Apart from a host of landing craft, many interesting and unusual ship types have been built in British yards during the last five or six years, from MAC ships ("merchant aircraft carriers") and heavy-lift vessels with 120-ton derricks down to "invasion" coastal tankers and little tugs.

Today the industry is once more getting into its peacetime stride, with the prospect of several years of full employment. For there is much work to be done in re-establishing the British merchant fleet, greatly depleted in specialized tonnage by the one battle which was continuous from that fateful Sunday in September, 1939, when the passenger liner Athenia went down with heavy loss of life.

EUROPEAN DIESEL DESIGN PROGRESS

(Continued from page 657)

with equal zeal toward the goal of employing the highest practical temperatures and pressure for live steam and intermediate superheating. Plants of the type in point attain, for instance, thermal efficiencies of 34-36 per cent at 2250 lbs./sq. in 1100° F. at the superheater outlet and 1100° F. intermediate superheating. The Sulzer Monotube steam generator (drumless boiler) is eminently suited for high-temperature plants owing to its simple construction and its reliable control of steam temperatures, which also holds good for starting and shutting down. The gas-heated intermediate superheater is built into the high-pressure boiler, a design of proved reliability.

Steam power plants of this type offer efficiencies such as are expected from the known forms of gas turbine plants, and are also quite able to compete with the latter in the matter of space requirements.

MODERN MOTORSHIPS

(Continued from page 650)

Thirty-two of these small tankers are being built, some at Todd-Houston Shipbuilding Company, Houston, Texas, and the balance at J. A. Jones Construction Company, Panama City, Florida. Twenty of these vessels are propelled by Nordberg two-cycle marine diesels. These engines are smaller than the cargo ship engines and have 18" bore and 29" stroke. They are rated at 1400 brake horsepower at an engine speed of 272 rpm. The engine drives the propeller through a reduction gear at a speed of 115 rpm. These engines are capable of a 10% overload, or 1540 horsepower at 280 rpm continuously, and a 25% overload for two-hour period. At 25% overload the engines will develop 1750 horsepower at 293 rpm.

Victory Motorship

The latest motorship to enter the marine picture is the new Victory ship Motorship Emery Victory, built at Sun Shipyard and propelled by Nordberg's 29" x 40" marine diesel engine. This engine, which is the latest single-acting engine in America, develops 6000 shaft horsepower at 160 rpm. This vessel has just completed successful sea trials, and these data will soon be available for publication. The principal dimensions of the Victory ship are as follows:

Length, over-all	455' 3"
Breadth, molded	62' 0"
Draft, loaded	28' 0"
Deadweight tons	10,800
Shaft horsepower	6,000
Designed speed	15.5 knots

C-3 Motorship

Eight C-3 vessels were built at Sun Shipyard, four of which were propelled by four Busch-Sulzer engines driving a propeller at 90 rpm through reduction gears, and four were propelled by twin Sun-Doxford engines driving a single screw through electro-magnetic couplings and reduction gears. All of these vessels were turned over to the Navy or our Allies and no records of their performance are available for publication.

So, a recapitulation shows that in the last six years approximately 400 large ocean-going motorships have been built in this country. This production, together with the excellent performance of these vessels, has at last placed America's merchant marine at the top of the list as far as modern motorships are concerned.

NEW BOOKLET

Surface Chemistry in Diesel Engine Overhaul, a new handsomely illustrated, fact-filled booklet, is offered by Turco Products, Inc. It describes in specific detail fast, simple methods of removing carbon, grease, oil, asphalt, tar, scale, rust and paint. A set-up for salvaging parts from wrecked equipment is explained.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton



When veterans of the Pacific campaigns return to the San Francisco Port of Embarkation, heading for separation centers—and civies—they receive a warm, tuneful welcome even before their boot touches at the pier. The above sign is on Fort McDowell, Angel Island, which the transports pass as they proceed to berth. The sign is illuminated at night and can be seen from all vantage points in San Francisco.

San Francisco's Port Welcome

San Francisco Port of Embarkation welcomes every single soldier who comes back from the Pacific with a program designed to show the Port's, the Army's and the nation's appreciation of what he had done and to make him realize he is back home again.

Paint, banners, buntings, huge outdoor signs and decorative devices are giving the harbor a festive, "Welcome Home" air.

Meanwhile, the "Welcome Home, Well Done" signs at Fort Mason and Fort McDowell constructed by SFPE authorities, and the end of Pier 15 have been illuminated so that they are plainly visible from ships entering the harbor at night.

The 400-ton yacht Cavanaugh, which has made three trips around the world, is the new "Welcome Home" boat of the Port. The trim, white-hulled vessel formerly was in the service of the U. S. Army Engineers in Alaskan waters. At one time this yacht was owned by Edsel Ford. It is now skippered by Captain Charles Bjork, who has sailed craft in the bay and its tributaries for





Above: San Francisco Port of Embarkation Pier 45 brightly and gaily decorated in flags, bunting and military insignia. This pier and Pier 19 are the principal debarkation piers of the Port.

At left: Aboard the "Welcome Home" boat the Camp Knight Band, with crowd of Port girls as a "welcoming committee" meet the arriving transports at the Golden Gate and escort them, with music, to the dock.

many years. The vessel is 146 ft. long and is powered by two 400-hp diesel engines. It carries a crew of 19 men.

Brought to the San Francisco Port of Embarkation by the Port's commanding general, Major General Homer M. Groninger, the Cavanaugh is being used to take groups of girls, and a military band, as far out as the Golden Gate Bridge to meet incoming troop transports.

On occasion a veteran aboard a transport will recognize someone on the gala boat. Then begins a "ship-to-ship" conversation aided by arm and hand signals, which frequently leads to a reunion at the Army debarkation pier.

The ferry boats San Leandro and Hayward have been added to the growing flotilla of craft being used to carry returning soldiers from the San Francisco piers to the debarkation centers.

Other vessels used to ferry returning soldiers to Camp Stoneman or the SFPE's other discharge center, Fort McDowell, are the Catalina, Army Queen, Cabrillo and FS-240.

These boats, with the Ernie Pyle, San Leandro and Hayward, have a combined capacity of more than 13,000, almost enough to move an entire division at one time.

Diamond Air Puff Blowers Represented on Pacific Coast

Diamond Power Specialty Corporation has recently set up marine service representation in Los Angeles, Portland, and Seattle, comparable to the service they have with George E. Swett & Co. in San Francisco, who have been their marine representative in that port for some 20 years.

The representative in the Los Angeles port is J. M. Costello Supply Co., 221 North Avalon Boulevard, Wilmington, California. In Portland, the representative is W. J. Robbins, 2201 N. W. Thurman Street; the Seattle and Puget Sound ports are serviced by Consolidated Services & Supply Co., 71 Columbia Street, Seattle; while George W. Swett & Co. will continue to be the San Francisco representative.

All of these representatives are specialists in marine service. They are prepared to visit and adjust Diamond installations on ships coming into Pacific Coast ports, and are able to assist in the ordering of any necessary replacement parts whenever needed, with the object in view of helping owners and operators derive the utmost satisfaction and economy from the Diamond equipment of soot blowers, both steam and Air Puff type, boiler water gages and smoke indicators.

An emergency stock of spare parts is carried by George E. Swett & Co. of San Francisco, for use in urgent cases. Arrangements are being made for prompt shipments from Detroit to other Coast representatives in order that steamship owners and operators on the Pacific Coast are given better service.

The company is proud of its service during the war years, and of the great percentage of new ships fitted with Diamond equipment. This is notable in the Victory ship program when all of these ships were equipped with Diamond Air Puff soot blowers. Nearly all of the T-2 tankers carry model G-9B soot blowers, as do large numbers of C-1, C-2, C-3, and C-4 and many of the high pressure T-2-A2 tankers, and the P-2 transports. The new ships for United Fruit will also carry this equipment.

There is expected quite a trend to the use of Air Puff soot blowers in future ships because of the many advantages such as completely automatic operation, no use or loss of fresh water, simpler piping without lagging, better cleaning efficiency and no soot nuisance on decks.

One Goes East—One Stays West

A couple of the biggest jobs in the Richmond shipyards setup were shuffled around a bit early in October and more changes are expected. The two jobs affected immediately were those of Clay Bedford, who will move his headquarters to Detroit as a vice president of Kaiser-Frazer Corporation, and Tim Bedford, who succeeds Clay in on-the-spot-supervision of all the Richmond yards.

Clay Bedford



Meanwhile, Einar Larsen will continue as assistant manager for Kaiser Co., Inc., now covering Yards One, Two and Three; W. A. Cannon will act as Procurement director for Kaiser Co., Inc., with M. G. Vanderwende as assistant director, both men handling purchasing, expediting, traffic and materials; and J. C. MacFarland will be general superintendent for Yards Two and Three with Al Fountain and Ken Flood as the respective Yard superintendents and Jack Konrad as general superintendent at Yard One.

Clay Bedford has been general manager of the Richmond yards since they were started. He has worked in Kaiser organizations for nearly 20 years. His first big job was as an assistant engineer on a $20,000,000 Cuban highway construction project. He also worked on all the big Kaiser contracts—Boulder Dam, Bonneville, Grand Coulee, Corpus Christi Naval Air Station—before coming to the Richmond yards. In his new job at Detroit he will be responsible for organizing production of the Kaiser-Frazer automobiles in conjunction with Frazer and Vern Drum, who is in direct charge of the company's operations.



Tim Bedford

Tim Bedford, who is Clay's younger brother, joined the Kaiser organization as a laborer at Boulder Dam. There he rose to the job of chief field progress engineer and later held various supervisorial positions at Parker and Copper Basin Dams, became assistant manager when Yard Two was built and until recently was in charge of Permanente Metals Corporation comprising Yards One and Two, the Victory Yard and Prefab.

NAVY DAY LUNCHEON IN SAN FRANCISCO

Maury Maverick, Chairman of the Smaller War Plants Corp., presents the "United Nations World Charter" flag to Mayor Roger Lapham of San Francisco during a luncheon at the Commercial Club. In the center of the picture is Artemus L. Gates, Under Secretary of the Navy and guest of honor at the luncheon. The flag flew over the Capital in Washington during the United Nations Conference in San Francisco and since that time has been hoisted at many of the Navy's advanced bases and on the USS San Francisco.

(Official Navy Photo)









Left, J. Lewis Luckenbach, chairman, American Merchant Marine Conference Committee; Center, Vice Admiral H. L. Vickery, USN, vice-chairman, U. S. Maritime Commission, presiding officer at the Merchant Marine Conference; Right, Alman E. Rath, president, National Federation of American Shipping, Conference speaker.

National Marine Conference Held in New York

(These photographs courtesy of U. S. Maritime Service)



John F. Gehon, national president, Propeller Club of the United States, who was re-elected for the forthcoming year.



At right: A West Coast Group at the Board of Governars luncheon.

Below: Legislature meeting. Left to right: Alman E. Rath, William Radner, R. J. Baker, and Ira L. Ewers.



As we go to press these pictures of the 1945 Convention personalities attending the American Merchant Marine Conference and the national meeting of The Propeller Club of the United States, held in October, arrived :n our office.

The theme of this year's conference was "Post-War Aspects of the American Marine Industry."

It is well known that the transition of the American marine industry from war to peace - time operations presents many problems which must be solved if the industry is to hold its

present position and progress to even greater heights of service to the nation. The panel discussions covered the manifold problems—the subsidy status of the ships sold for overseas trade under the American flag; the surplus of ships, our war-built fleet, their transfer to private American ownership or to foreign markets; the restoration and advance of American flag passenger service; overseas air transport and its effect upon merchant shipping; the future of the shipyard in the post-war world; and the all-important question of world trade.

A report on the national convention, together with excerpts from the principal addresses will appear in our December issue.







Above, right: Lieutenant Commander Harold G. Harding, USNR, national secretary, Propeller Club of the United States; Arthur Eldridge and H. E. Pickering.

At right: American Shipyards discussion was carried on by Joseph A. Moore, Jr., president, Moore Dry Dock Co.; L. R. Sanford (center), Director of Construction, U. S. Maritime Commission; and H. Gerrish Smith, president, Shipbuilders Council of America, chairman of this Panel.

Below, right: Port Authorities Panel. Left, G. L. Sheeley, chairman of the Committee on Law and Legislation of the American Association of Port Authorities; R. T. Spangler, president, American Association of Port Authorities, and Port Director, City of Miami, chairman of Panel, and Arthur Eldridge.





Mariner's Club Held Victory Banquet

FUN AND FROLIC ON OCTOBER 17, 1945









Ahoy, Mates!

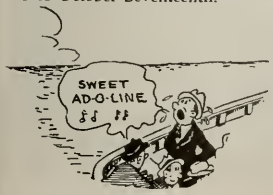
It will be noted by these two pages of pictures that the event held at the Palace Hotel was full of hilarious cheer and good spirits. The high spot of the evening was a stage show, the most spectacular ever to be recorded in the club's records. Club



Zoot Suit Glissman, master of ceremonies, whispering greetings.

president, Tommy Short, is to be congratulated!

About 400 of San Francisco's 'front executives, their port engineers, and captains, and others allied with the port's great shipping industry were piped aboard The Mariner's Club for a gala celebration of Victory on the eve of October Seventeenth.













"DAVY JONES LOCKER" CANTEEN

These scenes show recreational facilities available free of charge in "Davy Jones Locker" to the United States Maritime Service trainees quartered at the U.S.M.S. Center, 1000 Geary Street, San Francisco, California, while awaiting assignment to merchant vessels.

"Davy Jones Locker" is one of the activities operated by the Women's Organization for the American Merchant Marine, a non-profit organization functioning to advance the cause of the American Merchant Marine.

Shoreside Personalities

H. C. SMITH, VICE PRESIDENT **and district manager** of the Automatic Electric Sales Corp., located at 155 New Montgomery Street, San Francisco, is in charge of the company's Pacific Coast territory. He recently announced the appointment of the Marine Electric Company at 195 Fremont Street, San Francisco, as distributor of their marine telephone products in the Northern California area.

William Cathcart of Marine Electric Company says that his company will carry a complete stock of marine telephones and parts at all times and is equipped to handle all installation, service and repair work.

PAGE REJOINS GENERAL STEAMSHIP. Stanley A. Page, well known in shipping and travel circles, has returned to the staff of the General Steamship Corporation as Passenger Traffic Manager with headquarters at San Francisco, it was announced by H. S. Scott, president of the company.

Mr. Page served the company in a similar capacity from 1933 to 1941, leaving the company in July of 1941, when called to active duty in the United States Naval Reserve. Stationed in San Francisco for over four years Mr. Page was in the office of Port Director as assistant to the Operations Officer. In this position he helped direct the flow of war materials to the Pacific Theatre, serving also as Liaison Officer with the WSA and Army Transport Service. At the time of his release from the service Mr. Page held the rank of Lieutenant Commander.

U. S. Maritime Service Officers' School
AT ALAMEDA, CALIFORNIA
GRADUATING CLASS OF NOVEMBER, '45
(Deck Officers Section)



Section 5111-D: First row, left to right: John Dalrymple, Charles Dias, Robert Lotta, Lt. (jg) Charles Hendley (Section Officer), Robert Rarez, William Kleisath, Charles Langton. Second row: Robert Mlick, Roy Bowles, James Farley, Loren Pfeffer, Henry Keinz, William Sieg, William Burch, Henrie Farnworth. Third row: Joseph Lesperance, Edgar Warner, Morris Pelatti, Raymond Tingley, Edward Hartman, James Rainey, Gerald Enscoe, John Westrem, Rex Ka'ford. (Ralph Jensen, absent.)



Section 5113-D: First row, left to right: William Carhill, Sheldon Solloway, Richard Blockman, Robert Herbst, Lt. (jg) Douglass North (Sectional Officer), Jewell Farnsworth, George Ogden, Orval Bakken, William English. Second row: Russell Buell, Clifford Eggen, Frank Stoddard, Forrest Payton, Ralph Harding, Frank Sherer, Wilbur Dorsey, Lyle Burfitt, Edward Borrett.



Section 5114-D: First row, left to right: George Lough, Gordon Phipps, Lorenzo Bonozzola, Thomas Dorsey, Lt. (jg) Milton Block (Section Officer), Terrell Johnson, Robert Francis, Gayle Smith, James Parker. Second row: William Johnson, Hubert McCullough, Paul Lazoski, George Collins, Christopher Miles, Robert Reed, Jesse Gardner, John Harlan, Walter Nelson.

ENGINEER OFFICERS — NOVEMBER CLASS, '45



Section 5111-E: First row, left to right: John Stewart, Ralph Frink, Hilton Sonneborn, Frederick Smith, Ensign Adrian Atwill (Section Officer), Oron Peterson, Stanley Thorp, Herbert Goodmon, George Schulz, Omor Brands. Second row: Walter Osborn, Clifford Sterling, J. N. Gullett, Paul Jones, Maurice Von Bruaene, Gene Lindberg, John Taggart, John Evertz, Richard Oswald, Fronklin Fowler.



Section 5112-E: First row, left to right: Eddy Chambers, Jesse Holford, Everett Barbur, Lt. (jg) Richard Juhre (Section Officer), William Guppy, Robert Grimes. Second row: Lester Ovick, James Crowther, William Rich, John Glover, William Hamlin, Jack Taylor, Woodfin Coche. (Richard Iverson, absent.)



Section 5113-E: First row, left to right: David Brown, James Mootes, Howard Allison, Milton Formon, Leonard Walther, Lt. (jg) Irving Colt (Section Officer), William Border, Stuart Slattery, Bruce Chandler, Ted Limes, William Barnard. Second row: Donald McGrew, Calvin Chicks, George Cuevos, Rodger Holmstrom, Robert Smith, LeRoy Petersen, Ralph Johnson, Dudley Rockwell, Richard Bishop, Robert Phillips, Harry Chopin.

Section 5114-E: First row, left to right: Andrew Highom, Byron Provo, Frederic Wolford, Charles Goodwin, William Davis, Lieutenant Carl Leuck (Section Officer), Theodore Pujol, Howard Mills, Charles Cole, Edward Calhoun, George Stevens. Second row: Donald Shove, Charles Patton, Robert Insco, Joseph Osborne, George Davis, Robert Weinzinger, Richard Heilmann, Gordon Sheehan, Jack Anderton, William Boone. (Stefan Furmonek, absent.)



★ ★



Sperry Gyroscope Company will have companion equipments, *Radar* and *Loran*, available to the marine industry in the very near future—Radar with its ultimate potentialities in use with the Sperry Gyro-Compass—Loran for its electronic position indicating at sea. This equipment is the result of some of Sperry's greatest achievements for our Armed Forces. Now that peace is here, the same wonders of Radar and Loran are available to our Merchant Marine in equipment which meets the usual rigid tests and high-quality performance of all Sperry products, and is backed by Sperry's world-wide service organization.

SPERRY GYROSCOPE COMPANY, INC., GREAT NECK, N. Y.

Division of the Sperry Corporation

LOS ANGELES ★ SAN FRANCISCO ★ SEATTLE ★ NEW ORLEANS
CLEVELAND ★ BROOKLYN ★ HONOLULU

GYROSCOPICS • ELECTRONICS • RADAR • AUTOMATIC COMPUTATION • SERVO-MECHANISMS



Head table at the WOAMM's October meeting. Extreme left: Mrs. Stanley Schaller, Mrs. Chas. Stewart, Mrs. David Currier, Mrs. James S. Hines, Mrs. Hugh Gollagher, Mrs. G. M. Nelson, guest speaker, Mrs. Frank Short, president of WOAMM's, Miss Elsa Ing, Mrs. Allan Toole, Mrs. J. Johnston, Mrs. K. G. Amos, Mrs. Charles Wheeler, Miss Alicia Mosgrove, chairman of the Woman's Committee, American Merchant Marine Library Assn., and Mrs. Myles O'Brien.

Functions of Marine Hospital told W. O. A. M. M.'s

Mrs. G. M. Nelson, director of the Marine Hospital in San Francisco (the Merchant Marine hospital) spoke before a large gathering at the October 9 meeting of The Women's Organization for the American Merchant Marine.

During her talk she made an appeal to the organization to help the hospital staff during the overcrowded period in the hospital by volunteering service along with the hospital workers and social workers. They do need help, and the volunteer service between the hours of 10 a.m. to 3 p.m. seems short when you consider it may put some man back to sea sooner.

This hospital has been running since the last war under Mrs. Nelson's guidance. She told of the hospital's history and the problems that have confronted the organizational staff of the hospital during the period before the war when they were struggling to stay open. To this end the steamship companies lent their assistance.

The State Rehabilitation has done a great job to help the long term hospital patients, some of whom have worked up lucrative trades. Others have been helped through this program, and either have gone back to sea or have gone into a commercial trade.

The functions at the Marine hospital consist of entertainment from

(Please turn to Page 76)



Mrs. Nelson, Director of San Francisco's Marine Hospital.

WILMINGTON TRANSPORTATION COMPANY

General Agent: War Shipping Administration

GENERAL TOWAGE AND LIGHTERAGE SERVICE
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WHISTLE CALL FOR TUGS: 1 long — 3 short
GENERAL OFFICE: 175 West Water St., P. O. Box 847, Wilmington, Calif.
Phones: Terminal 4-5241; Nevada 615-45; Long Beach 7-3802



NEW EYES FOR THE LOOKOUT...



Drawing from an actual photograph of the radar screen on a ship steaming westward in the Mediterranean Sea, showing the Straits of Gibraltar and the Atlantic Ocean beyond. This illustrates one of the navigational uses of radar.

RADAR *by* RAYTHEON!

COMPLETE SAFETY AT SEA . . . goal of centuries . . . comes closer today as Raytheon turns radar to peacetime applications.

To this end, Raytheon is planning a complete line of marine navigation equipment. Called "Raytheon *Ray*dar," it is based on the successful operation of the Raytheon-built Navy Model SG and SO radar which led all others used by our Navy for surface search.

This will be precision equipment that will probe through darkness, fog and storms, revealing obstacles far beyond a lookout's range of vision. It will outline icebergs, other ships, coastlines, and compute their distances. It will even guide ships into harbors and to the entrances of locks, avoiding costly delays.

To insure maximum performance of this new equipment, Raytheon's already existing world-wide organization of Field Engineers will be available in major ports. The aim of this service group will be to inspect equipment regularly and prevent troubles before they develop.

An informative booklet on "Raytheon *Ray*dar" details some of Raytheon's immediate plans for marine navigation radar equipment. It will gladly be sent free on request.

RAYTHEON
MANUFACTURING COMPANY

RADAR DIVISION
106 Willow Street Waltham, Mass.

Excellence in Electronics

Functions of Marine Hospital Told W.O.A.M.M.'s

the outside, two church services on Sunday and a stage show or movie in the afternoon. Occasionally these shows are staged in the wards. Three times a week books are passed out from the library in the wards.

The office staff traces the men's sea bags, arranges transportation home for the boys, writes their letters and makes telephone calls. When the man is ready to leave, the staff issues clothing to suit his needs.

Considering that there are only 26 marine hospitals in the United States, you can gather the amount of work that has gone on in San Francisco's Marine Hospital and the part Mrs. Nelson and her assistant have played in its successful management.

The Women's Organization of the American Merchant Marine was well represented several weeks later at the Marine Hospital by Mrs. June De-Rochie, entertainer deluxe, who brought cheer with her songs and sparkling personality to the boys in the hospital wards.



Owners of C. J. Hendry Firm

A further development in the ownership of the C. J. Hendry Company, world-famous ship chandlers' firm, has occurred during the past month. The controlling stock interest has been contracted for by Leland D. Adams and George H. Grant, president of the First California Company.

In keeping control in San Francisco of this company, founded in 1865, which handles ship chandlery and commercial fishing supplies on the West Coast, Adams and Grant purchased the company's stock from the University of California and Stanford University. The stock had been bequeathed to these two Universities.

Mr. Adams has long been prominently identified with San Francisco business life. As head of the California Salt Company, he built the first modern salt refinery in the Bay Area in 1923 and later became Executive Vice President of Leslie Salt Company when a consolidation took place with his company. He left the company in 1942 to become Special Consultant for the Quartermaster Corps, U. S. Army, in the Price Adjustment Section. He is a director of the Pacific National Bank.

Mr. Grant recently merged his long established investment firm with the Bankamerica Company and became head of the consolidated firm, the First California Company, with offices throughout California.

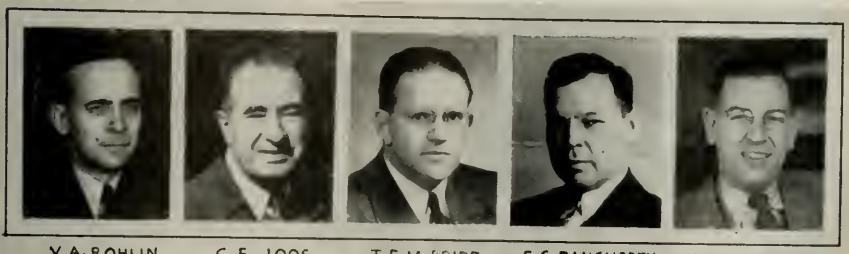
New Treasurer At B & W

A. G. PRATT, president of The Babcock & Wilcox Company, announced the retirement from active service of William Sheldrick, who has been an official of the company for 46 years, and the appointment of W. G. Dryden as his successor, effective October 4.

Mr. Sheldrick was treasurer and assistant secretary of The Babcock & Wilcox Company and The B & W Tube Company. Mr. Dryden succeeds to these positions.

ALL COMMERCIAL HARDWOODS • DOMESTIC AND IMPORTED
Lumber, Flooring, Veneers, Plywood and Dowels
WhiteBrothers
HARDWOOD HEADQUARTERS SINCE 1872
5th and Brannan Streets
San Francisco, Zone 7
SUtter 1365
500 High Street
Oakland, Zone 1
ANdover 1600

Cochrane Corporation's New Officials



V. A. ROHLIN C. E. JOOS T. E. McBRIDE E. S. DAUGHERTY A. E. KITTREDGE

Cochrane Corporation of Philadelphia, manufacturers since 1863 of steam power plant and industrial equipment, has been acquired by a group of men long associated with the company in the engineering and sales divisions. The new corporation will be managed and operated by its owners. T. E. McBride was elected president and the following men named as vice presidents: C. E. Joos, Apparatus Division; V. A. Rohlin, Works Manager; A. E. Kittredge, Chief Engineer, and E. S. Daugherty, Heater Division. The Board of Directors includes H. E. Sibson, for many years the company's general sales manager, and W. V. Sauter of Philadelphia. There will be no change in the widely-known Cochrane line or sales policies, nor in the nation-wide sales representation of the company. An aggressive program of development and research is planned to maintain the company's leading position in its field.

Representative of President in Greece

Confirmation of the appointment of Dr. Henry F. Grady as personal representative of President Truman to head the American group which will participate with representatives of the British and French Governments in observing the forthcoming elections in Greece was received October 20 at the San Francisco headquarters of American President Lines of which Mr. Grady is president.

The announcement was made in Washington by Secretary of State Byrnes. Dr. Grady will have the personal rank of ambassador, Mr. Byrnes said, adding:

"This appointment follows the acceptance by this Government of the invitation extended to it by the Greek Government last August. This action is taken in accordance with responsibilities which the American Government accepted at the Crimea Conference to assist the peoples of European countries formerly occupied or dominated by Nazi Germany in solving their political problems by democratic means and in creating democratic institutions of their own choice."

McCormick S. S. Executive Changes

George H. Bushnell, who was assistant to the operating manager of the McCormick Steamship in the San Francisco office, was recently transferred to the Los Angeles office of the company as district manager at Los Angeles.

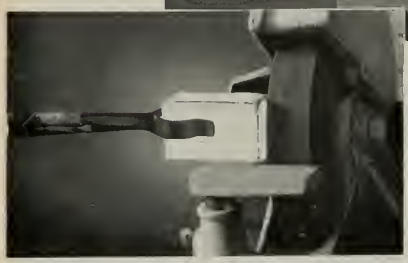
Harold Starr, who is now occupying the position of assistant to the operating manager, came to San Francisco from the company's Wilmington office where he had been employed since 1936, recently leaving the position of assistant to the district operating manager.

Starr majored in foreign trade and transportation under Henry Grady at the University of California, and after graduating from Cal in 1932 he went to sea with The Dollar Line for some time.

BRICKSEAL
REFRACTORY COATING



White hot uncoated brick held against emery wheel turning at 1800 rpm.



White hot BRICKSEAL-coated brick held against emery wheel.

RESISTS ABRASION

PROTECTION against abrasion is an outstanding advantage of Brickseal. Here are two refractory bricks, one coated with Brickseal, the other uncoated. They were heated to more than 2000°, taken directly from the furnace and shoved against an emery wheel. Hot and cold, the Brickseal-treated brick resisted the abrasion—see below.

Brickseal consists of high fusion clays and metal oxides combined in oil. Furnace heat burns away the oils and vitrifies the clays and metals which penetrate deeply into the pores, cracks and joints. Brickseal prevents cracking, spalling and slagging regardless of sudden temperature changes. Brickseal is also a mortar for laying up refractory walls.

COATED BRICK





UNCOATED BRICK



TRY IT YOURSELF
on your emery wheel

Two bricks bonded together and partially coated with Brickseal will be mailed to you on request.

BRICKSEAL
REFRACTORY COATING

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Arne Minden Aas, president of the Minden Shipping Corporation, has announced the opening of the Carporation's office at 44 Whitehall Street, New York. The firm is to engage in general ship brokerage.

Minden Shipping Corp. Opens in N. Y.

The Minden Shipping Corporation, organized under the laws of N. Y. State, has opened its office at 44 Whitehall Street, New York City, according to an announcement by Arne Minden Aas, president and treasurer. The firm will engage in general ship brokerage, act as owners agent and managing operators, buy and sell cargo vessel and yachts as brokers and for own account, and also operate its own department for marine supplies and export.

Mr. Aas, a well-known Norwegian shipping man, was formerly connected with Neptune Shipping, Inc., agents for the Norwegian Shipping and Trade Mission in New York. He also represented the Mexican government, Mosvold Fruit Line, Wallem and Co. of Hong Kong, and other shipowners as their agent in the Panama Canal Zone and Central America. Vice president and secretary of the new firm is Pieter F. X. de Vos, former New York stock broker and more recently a manufacturer of airplane parts. Mr. de Vos is widely known in yachting circles.

Lieut. Comdr. William B. Leeds, U. S. Coast Guard, a prominent yachtsman, is interested in the Minden Shipping Corporation.

The many American and Norwegian friends of Mr. Aas wish him and his associates success in their enterprise.

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CHICO . . . . . Don L. Buckman, P.O. Box 278—2398 W
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Howard Oxsen
Fairbanks-Morse

Fairbanks-Morse Staff Changes

Howard Oxsen who for many years has been attached to the Diesel Engineering department, as manager of the Engine and Railroad Department, Pacific Coast Division, of the Fairbanks, Morse Co., with offices located in San Francisco, has now been transferred to the Chicago office of the company on a special assignment. His many friends in the marine field here wish him every success in his new duties.

Harry G. Nagel, formerly manager of the company's Electrical Department in the San Francisco office, has taken over as manager of the Diesel Engine Department. He has spent many years in the Diesel Department of the company. His knowledge of this engineering branch is quite extensive, and since 1936 he has acted as instructor in diesel engine theory at the Samuel Gompers Trade School.

Willard Froisland is now manager of the company's Electrical Department.

H. G. Nagel





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Willard S. Briscoe
Bethlehem Steel Co.

Publications Head At Bethlehem

Bethlehem Steel Company has announced the appointment of Willard S. Briscoe as head of its Publications Division, West Coast. In this capacity, he will be in charge of the company's press relations in the Pacific Coast area, succeeding M. D. Salisbury.

Gordon H. Dent has been named as his assistant. Mr. Dent was formerly a member of the Industrial Relations Department of Bethlehem's San Francisco shipyard.,

Mr. Briscoe will represent both the steel and shipbuilding operations of the company on the West Coast, having his central office in San Francisco, with offices also at Los Angeles and Seattle.

M. D. Salisbury, who is returning to the general offices of the company at Bethlehem, Pa., will resume his post as head catalog writer for the concern. He has headed the Publications Division, West Coast, for the past eighteen months.

A Bethlehem Retirement

William P. Young, rigger foreman at Bethlehem Steel Company's San Francisco Yard, retired after 38 years of continuous service.

Mr. Young, who was made foreman of the yard's rigging department in 1936, lives at 1461 Howard Avenue, San Carlos. He was known as the yard's star rigger, and all heavy, difficult jobs were turned over to him.

USMS UPGRADING SCHOOL AT 1000 GEARY STREET, SAN FRANCISCO

DECK OFFICERS' GRADUATING CLASS, NOVEMBER



Front row, left to right: Lt. (jg) C. C. Russell, USMS, Lt. (jg) L. L. Hotch, USMS, Lt. James A. Pae, USMS, Lt. (jg) James S. Gallagher, and Lt. (jg) R. D. Welch.
Rear row: Lt. H. E. Currey, USMS, Lt. (jg) E. L. Wheeler, USMS, Lt. Calvert S. Wilson, USMS, and Lt. (jg) Vincent C. Cauley, Jr., USMS.

DECK OFFICER INSTRUCTORS AT THE SCHOOL



Left to right: Lt. James G. Truman, Lt. (jg) Frank L. McCullough, Lt. Comdr. John A. Mattson, Ensign Valdemar N. Krogh, Ensign Stanton Janes, and Warrant Bos'n. Louis W. Parente.

Follows Father's Footsteps

Major Reginald V. Grady of San Francisco is apparently following in the footsteps of his distinguished father, Dr. Henry F. Grady, former Assistant Secretary of State and a recognized authority on world trade and economics.

Young Major Grady, in recognition of his outstanding service as Industry and Commerce Officer for Italy, has been appointed honorary member of the Most Excellent Order of the British Empire, according to word received by his parents from the British Consul in San Francisco.

It was in Italy, oddly enough, that Major Grady's father twice served his Government during World War II on economic missions of great importance. The latter is now President of the San Francisco Chamber of Commerce and President of the American President Lines.

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Write for Catalog M6

FRANCE PACKING COMPANY
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Barlow Dies

Capt. Harry Barlow, 69 years old, retired mariner, and inventor of the Barlow marine elevator, died October 9. Captain Barlow was born at Richardson, Wash., on Lopez Island of the San Juans, and had been a resident of Washington all of his life. Surviving are the widow, a daughter and two brothers, Dan in Seattle and George in Ketchikan, Alaska. Masonic funeral services were held in Seattle October 13.

Tube Turns New VP

Harry G. Howell, one of the nation's foremost forging specialists and and authority on factory management, is the new vice president of Tube Turns, Inc., Louisville, Ky., in charge of production. A native Kentuckian, he returns to the Bluegrass after four years as head of Oldsmobile's plant and a total of twenty-two years' association with General Motors. Born in Kilgore, Ky., he attended Purdue and began his career with GM's Buick Division.



Harry G. Howell of Tube Turns, Inc.

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Twenty years ago, an agricultural West looked Eastward for its major industrial needs. Today, a full fledged Industrial West has come into being—one whose unparalleled growth shows promise of a post-war importance even more impressive than its already extensive contributions to the war effort.

Marwood is proud of its twenty years' contribution to the growth of this western industry. But Marwood, too, has grown along with the industry it has served. Today, Marwood maintains four strategically located warehouses, with stocks of essential materials available for prompt delivery, and Marwood technicians are at your service to help solve your technical problems. A letter addressed to Marwood will bring complete information on any of the products of these well-known manufacturers—

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H. B. SHERMAN MFG. CO.
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Back to Sea

CAPTAIN V. PAUL MARSHAL, until recently Port Captain for Deconhil Shipping Company, has gone to sea again, sailing out of Mobile, Alabama. When last heard of he was on the SS Chisholm Trail, bound for the Marshall Islands.

Whistling Jim

The "Jolly Postman" of 1944 has given way to "Whistling Jim" of 1945. The postman appeared on the Christmas Seal of a year ago. This year the Christmas Seal Sale will open Monday, November 19, and continue until Christmas. Featured on the little sticker is "Whistling Jim," a walking boy carrying a holly wreath.

The 1944 postman had good reason to be jolly for the last Seal Sale totaled more than $1,247,000 in California. As a result of this record-breaking sale, local tuberculosis associations were enabled to introduce new equipment and services in the battle against tuberculosis. Most spectacular was the operation of units for the taking of chest X-rays, the most successful method of finding hidden tuberculosis.

"Jim" of the 1945 Seal is whistling in anticipation of another record sale. Tuberculosis associations point out that they are interested only in a big response for the purpose of maintaining and expanding programs that million-dollar sales enabled them to start within the past two years; not to satisfy a pride in establishing new records nor to build up reserves.

NEW YORK SHIPBUILDING CORP.
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IN THE NAVY AND MERCHANT SERVICE

SHORESIDE PERSONALITIES



Marion M. Smith, of Ship Service Operators Assn.

Marion M. Smith was recently appointed manager of the Ship Scaling Contractors Association of San Francisco and the Bay District, with offices at 24 California Street, San Francisco. He will represent the members of the above association in the handling of all industrial relations between employer and employee organizations.

Mr. Smith, who is a well-known local attorney, was released from the Army Transport Service after serving two years in the South Pacific War theater.

Albert J. Lilygren Company, engineers and factory representatives with offices in all principal Pacific Coast cities, have been appointed West Coast representatives for the complete line of compasses and navigation equipment manufactured by John E. Hand & Sons Company of Philadelphia. A stock of this equipment will soon be available on the coast for quick delivery.

G. J. Keady, executive vice president of the Sharples Corporation, centrifugal and process engineers of Philadelphia, with representatives throughout the world, announces the appointment of **Charles E. Printz** as sales manager.

Mr. Printz, up until the outbreak of war, was connected with the Export Division of the company, and was in charge of South American sales. He returned to the United States in 1942, where he has functioned in the Production Department and as director of Purchases of the company.

G. J. Keady of Sharples Corp.



"Headquarters at the Harbor!"

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"On Deck and Below"

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THE GARLOCK PACKING CO.

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Shoreside Personalities

THOMAS G. PLANT returned to San Francisco recently to resume his position as vice president of the American-Hawaiian Steamship Company, after a tour of duty with the U. S. Army, in which he held the rank of Colonel.

CHESTER T. TRUAX, during the first part of October, was appointed to the staff of Panama Agencies Co., subsidiary of Grace Lines, with headquarters at Cristobal. Mr. Truax recently resigned from the recruitment and manning division of the War Shipping Administration.

NEIL S. LAIDLAW, San Francisco port manager, attended the annual sessions of the American Association of Port Authorities at Chicago.



James E. McDonald, chief safety engineer of Kaiser Shipyard No. 2 at Richmond, just elected Chairman of the S. F. Chapter American Society of Safety Engineers.

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HALF MODELS . . . For the men who lay out the ship's plating.

STRUCTURAL MODELS . . . For analysis and solving problems of prefabrication.

STRUCTURAL SECTIONS . . . For visual training of personnel new to shipyard work.

LARGE SCALE MODELS . . . Fully detailed, decorated models, showing the completed ship from stem to stern, keel to topmast. A tangible record of shipyard achievement and an inspiration for all shipyard personnel.

VAN RYPER · VINEYARD HAVEN · MASSACHUSETTS

JOHN R. PAGE was named head of the European department of General Steamship Corp., at San Francisco. He was discharged recently from the Navy where he served on the staff of the port director at San Francisco with the rank of Commander.

DAVID LINDSTEDT, after an absence of two years, has returned to the steamship department of Balfour, Guthrie & Co., Ltd., at San Francisco.

WALTER D. BRENNAN has been elected vice president in charge of traffic of the Pacific-Atlantic Steamship with headquarters at Vancouver, Wash. Mr. Brennan recently was discharged from the Army, where he held the rank of Colonel. Before the war he was traffic manager of States Steamship Company.

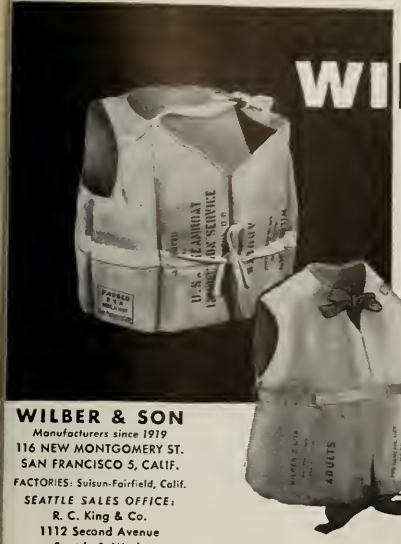
HENRY P. WEEGELEIN has been appointed director, Division of Lend-Lease Procurement and Interdepartment Fiscal Relations, for the War Shipping Administration.

CAPTAIN WALTER N. PRENGLE has been discharged from the Navy and assumed his post as terminal manager for the Grace Line in New York. During the war he held the rank of Captain and was in charge of cargo handling in South Pacific island ports.

Captain Prengle, a native of San Francisco, started his sea career with the old Pacific Mail, then with Panama Mail. He was skipper on the luxury liner Santa Elena when this vessel operated with the Santa Rosa and Santa Paula to New York via the Spanish Americas from California ports.

HENRY CLAYTON, sales manager of the Marine Products Company of Detroit, arrived in San Francisco the middle of October on a business trip covering the entire Coast from San Diego to Vancouver. He was accompanied by A. J. Lilygren, of the Albert J. Lilygren Company, 214 Front Street, San Francisco, who are coast representatives of the Marine Products Company.

WILBER & SON, OF SAN FRANCISCO, CALIFORNIA, makers of WILCO life preservers, sleeping bags, and canvas goods, recently announced the appointment of G. E. Smith as sales manager of the firm.



WILCO LIFE PRESERVERS

Immediate delivery can now be made on approved life preservers for essential needs. Pictured are the Wilco Cork Life Preserver (top) Coast Guard Approval No. A67 and the Wilco Kapok Life Jacket (bottom) Coast Guard Approval No. B249. Wilco products have been "Designed for Survival" since 1919.

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BESTCO BLOCKS are available in standard sizes and can also be furnished for special requirements.

Steel Plate Wire Rope Snatch Blocks



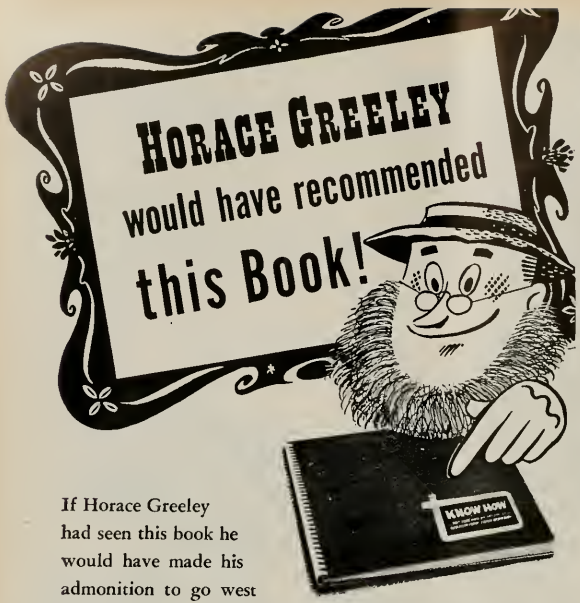
Extra Heavy Steel Wire Rope Blocks



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If Horace Greeley had seen this book he would have made his admonition to go west even more specific. He would have said, "Go West, young man . . . and get in touch with Commercial Iron Works in Portland, Oregon".

For this book tells the complete story of how Commercial Iron Works is prepared to serve industry in the postwar markets of the Pacific Northwest, Alaska, Asia and the countries beyond the Pacific.

It covers Commercial Iron Works' design and engineering staff; its construction facilities; its assembly and installation experience; and the sales and service it is prepared to offer.

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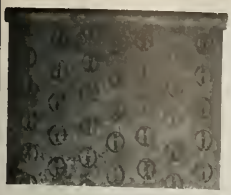


J. J. Steitz, Jr., has been appointed manager of the marine fuel oil department of the Standard Oil Company of New Jersey.

ESSO PROMOTIONS: Clarke Bedford, executive vice president in charge of Sales, Standard Oil Company of New Jersey, recently announced that: J. W. Connolly has assumed his new duties as vice chairman of the Marketing Council and manager of the Marketing Council department of the Standard Oil Company (N. J.), and that J. J. Steitz, Jr., formerly assistant manager, has been appointed manager of the Marine Fuel Oil sales department.

The Manila offices of Lykes Bros. Steamship Company were re-opened October 1, and a full staff is now in charge for the first time since the Jap occupation of the Islands. Lykes Bros. is one of the participants in the bidding for the American President Lines.

THE EDISON GENERAL ELECTRIC Appliance Company (Hotpoint) recently announced the appointment of the Marine Electric Co., of 195 Fremont Street, San Francisco, as their sole marine service representative for the Northern California area. William Cathcart, the president of Marine Electric Company, says that a complete line of parts will be carried, and the skilled staff will always be available to carry out any necessary repairs while the ships are in port.



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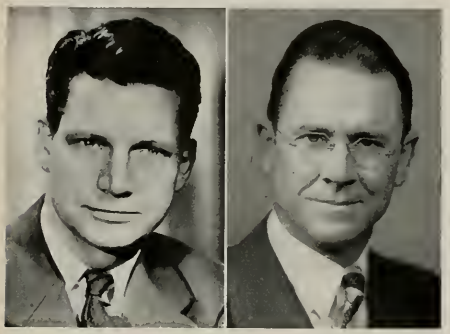
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A. N. Anderson and M. H. O'Brien of the firm Anderson-O'Brien Company.

S. F. FIRM SALES OUTLET FOR GM

The appointment of Anderson-O'Brien Company as retail sales outlet for the GM Series 71 diesel engine, with headquarters at 748 E. Washington Boulevard, Los Angeles, was announced by V. C. Genn, general sales manager for the Detroit Diesel Engine Division of General Motors Corporation.

A. N. Anderson is the sales manager, and brings to the company over 10 years' experience in selling and servicing diesel engines in all lines of industry. For the past seven years he has been associated with the Sales Department of Detroit Diesel, supervising applications of its diesel engines to diverse industrial end products.

Milt O'Brien is to direct the Service activities of the Anderson-O'Brien Company and is well qualified for this assignment, having served in executive service capacities for the Pontiac and Buick Divisions and on the service staff of General Motors Corporation.

The Anderson-O'Brien Company assumes responsibility for sales and service of the GM Series 71 engines for Irrigation, Oil Fields, Mining and Contractors' machinery in the counties of San Diego, Orange, Inyo, Imperial, Los Angeles, Kern, Riverside, San Bernardino, Santa Barbara, San Luis Obispo and Ventura. The company will cover the marine industry in the counties of Santa Barbara, San Luis Obispo and Ventura.

Stoneware Acquires Plastispray

The United States Stoneware Company, of Akron, Ohio, announces the acquisition of the plant, processes, equipment and personnel of Plastispray Corporation, 927 North Sycamore St., Hollywood, California.

With the resumption of our Philippine service, if present plans materialize, American President's familiar house flag will again appear in the various ports of the United States - Hawaiia - Mediterranean to serve an expanded world commerce with the facilities offered by an entire new fleet of fast ships.

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Danforth Saves Fishing Boat in Heavy Gale...



Wm. May often leaves his boat anchored with a Danforth at Half Moon Bay, south of San Francisco. May "wouldn't feel easy leaving it without this anchor." In a letter he states:



35-ft. "Belle of Dixie" owned by Wm. May, San Francisco

"The storm was one of the worst that ever hit this coast and I am unable to reach the boat. It was anchored with a 30-lb. Danforth with 200 ft. of chain and 1½-inch manila because in bad storms the rope is like a spring. The wind was from the southeast and swung to the northeast with all the force that a gale can give. I am on shore helpless, just watching the boat while it circles around the anchor. On my third attempt to reach the boat, we have a good chance to make it, but the last swell beyond the breakers raises the skiff, crashes down and we are washed ashore ... Another big fishing barge about 45 ft., breaks loose and drifts ashore. If they had a Danforth they could have saved the boat. ★ After drying out, another attempt was made. I got aboard ... and while I am aboard I appreciate the good anchor the Danforth is. I would put all my confidence in it. It won't foul because in that bad storm the wind changed in two directions but the Danforth didn't. ★ I won't have nothing else but a Danforth because I started with boats since I was a small boy and I haven't seen nothing would hold like this anchor."



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Pyrometers
Salinity Indicators

Circuit Testers and Analyzers
Ammeters
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APPLY CHIEF, ENGINEERING DIVISION





Top: R. B. McColl, elected executive vice president of American Locomotive Co. Below: W. L. Lentz, who has been elected vice president of American Locomotive Company in charge of manufacturing. He succeeds R. B. McColl.

New Exec. Vice Pres. for Alco

Election of Robert B. McColl as executive vice president of American Locomotive Company was announced by Duncan W. Fraser, president. Mr. McColl is succeeded as vice president in charge of manufacturing by **W. L. Lentz** of Schenectady who directed the company's vast tank and locomotive manufacturing program there the past five years.

Mr. McColl is one of the few American members of the Institute of Mechanical Engineers, London, and has been engaged in locomotive manufacture since boyhood when he started as an apprentice with the Glasgow and Southwestern Railroad in Scotland.

After a period with the original builder of the Steam locomotive, Robert Stephenson and Sons in Darlington, England, he went with the Montreal Locomotive Works in Canada, an affiliate of American Locomotive Company. After World War I he was with the Armstrong Whitworth Company in England but soon returned to this side with American Locomotive Company as assistant manager of the Schenectady works.

He has since been successively manager of this plant, president of the company's diesel engine manufacturing division, formerly the McIntosh and Seymour Corporation, president of the Alco Products Division of the company, and vice president in charge of manufacturing for the locomotive company.

STATEMENT OF OWNERSHIP

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of PACIFIC MARINE REVIEW, published monthly at San Francisco, California, for October 1, 1945, State of California, County of San Francisco.

Before me, a notary in and for the State and county aforesaid, personally appeared MR. JAMES S. HINES, who having been duly sworn according to law, deposes and says that he is the Publisher and Partner of the PACIFIC MARINE REVIEW and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher, JAMES S. HINES, 500 Sansome St., San Francisco.
Editor, ALEX J. DICKIE, 500 Sansome Street, San Francisco.
Managing Editor, T. DOUGLAS McMULLEN, 500 Sansome St., San Francisco.
Business Manager, BERNARD N. DE ROCHIE, 500 Sansome St., San Francisco.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)
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James S. Hines, Partner, 500 Sansome St., San Francisco.
Bernard N. De Rochie, Partner.
Mary G. Hines, Partner.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)
None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JAMES S. HINES,
Publisher and Partner.

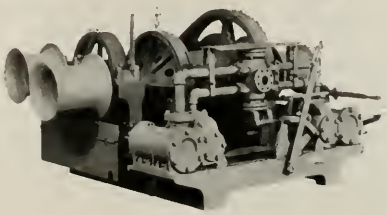
Sworn to and subscribed before me this 1st day of October, 1945.

EDITH VIA,
(SEAL) Notary Public in and for the City and County of San Francisco, State of California.
(My commission expires September 3, 1948.)

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New Ore Carriers

(Continuation from page 652-H)

buckets are used for this work, with small buckets for the final clean-up, which is facilitated by the sloping bottom at the sides and corners of the holds. Normal unloading time is about 24 hours.

Propulsion Machinery

The machinery design for the S.S. Venore establishes new standards of performance for steam propulsion of cargo vessels. The power is large for a single screw vessel and the machinery is of the high-pressure steam reheat type, a departure from present marine practice.

The main propulsion unit consists of high-pressure, intermediate-pressure and low-pressure Bethlehem turbines driving the shaft through double-reduction Falk gearing. Steam reheaters of the Foster-Wheeler horizontal single U-tube pass type are arranged between the high and intermediate pressure cylinders and between the intermediate and low pressure cylinders.

The ship is driven by a single propeller, 22 ft. in diameter, operating at 99 rpm, and is equipped with a double plate, streamlined rudder with a fixed post.

Steam at 1450 psi pressure is generated in two Combustion Engineering Corporation boilers of the 2-drum, single furnace type, equipped with economizers, air heaters, and superheaters. High pressure superheated steam is used by the main turbines, the turbo-generators, the turbine driven feed pumps, and the steam reheaters.

One fire pump is also turbine driven. Practically all the remaining engine room equipment is electrically operated, with power furnished by two General Electric 400-kw, high efficiency generators. A Caterpillar-General Electric diesel driven generator is provided for emergency use and for cold-ship starting.

A bunker capacity for 13,600 barrels of fuel oil gives the S.S. Venore a cruising radius of about 12,000 miles. The machinery was designed to give a better fuel record than ever before attained in an ocean-going power plant of similar size. On the endurance trial the oil consumption was 0.504 lbs. per shaft horsepower per hour. The service speed is in excess of 16 knots, with full load of cargo, fuel, water, stores and crew.

In addition to the Davis Engineering Company fresh water evaporating plant a large capacity Bethlehem distilling unit is installed, ample to take care of the total requirements of machinery and crew at all times. Total capacity for evaporating and distilling is more than 50 tons per 24 hours.

Due to the large size of the vessel, unusual provisions have been made for mooring. These include nine large Street Bros. Machine Company steam

(Continued on page 96)

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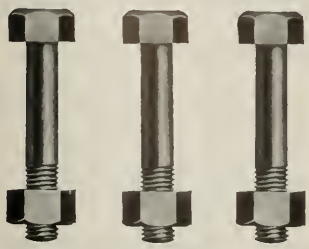
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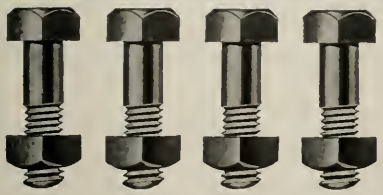
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HOT OFF THE PRESS

Cramp Brass & Iron Foundries Division of Baldwin Locomotive Works has issued a 44-page illustrated catalog giving the composition, applications and complete physical properties of many brass, bronze and iron alloys that are generally used in industrial and engineering application. Also included are formulas useful in calculating the weight of castings and definitions of terms used in testing materials.

A new 40-page Rivnut Data Book has just been published by The B. F. Goodrich Company. The data give the typical Rivnut thread strength, eccentric loads, single and double shear loads, tension loads and torque resistance. On comparative tests the brass Rivnut, only recently introduced, has approximately twice the strength of the corresponding aluminum types.

A new 24-page, two-color booklet, No. ADG-2014, entitled "Oxygen—Indispensable Servant of Industry," profusely illustrated and fully telling the interesting story about oxygen—how it is made and how it is used in industry—has been published by Air Reduction Sales Company.

Bulletin W-2, Ampco-Trode Welding Technique, put out by Ampco Metal, Inc., tells of various welding practices with Ampco-Trode.

"When You Reconvert," an illustrated four-page folder, B-3888, issued by The Farval Corp., points out the advantages of the centralized lubricating system when installing maching equipment for post-war operations. It sets forth the basic facts in a compact summary showing how the system operates, with statements of specific results attained through its use.

"Gruv-Seal, Forged Iron and Alloy Ring Gaskets," is the title of Bulletin No. 45, published by the Steel Improvement and Forge Company. This well-illustrated, two-color brochure gives complete information and buying data on forged gaskets made of ingot iron, nickel, chromium and Monel metals.

Diesel Facts, Book I: Growing demand for diesel engines for producing the power in municipally-owned power plants is revealed in this new booklet published by Diesel Engine Manufacturers Assn. Covering the use of diesels in city power plants, the booklet is the first of a series to be issued by the association.

"Labor-Saving Chemical Methods for Cleaning, Paint Stripping and Corrosion Removal in the Shipbuilding Industry" is a new folder recently prepared by Turco Products, Inc.

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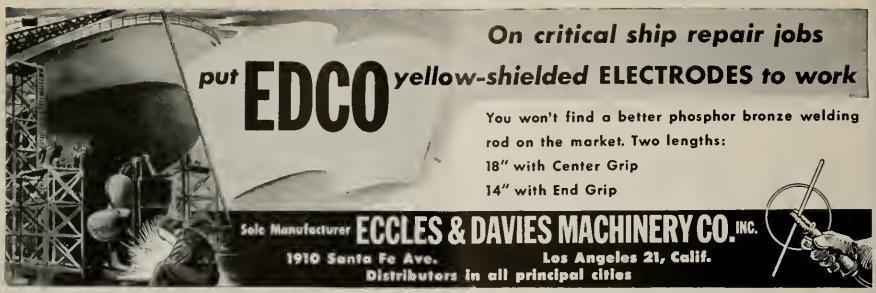
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The New Ore Carriers

(Continued from Page 92)

mooring winches, two on the forecastle deck, two well forward on the upper deck and five on the poop deck. Each winch has a 13,000-lb. drum pull at 50 ft. per min. and is equipped with a drum accommodating 600 ft. of 6 x 24 bethanized wire rope. No manila or sisal is used in mooring except as required during transit through the Panama Canal.

The navigation equipment includes Sperry gyro compass with repeaters, radio direction finder and sonic depth finder. Radio receivers and transmitters of the latest type are installed, for receiving and sending messages over all legal wave lengths. The vessel is also fitted with Plant-Mills revolution indicators and wrong direction alarm, and with the usual engine room telegraph and telephones.

Under normal conditions the S.S. Venore has a complement of 49. Living quarters are all above the upper deck, with no quarters in the forecastle. Crew's accommodations have been laid out with not more than three men berthed in any room, and with individual toilet and shower adjacent to each room. Fireproof construction and metal furniture are used throughout. All quarters are group heated and ventilated with motor driven fans, and the air supply is filtered. Power ventilators are also fitted in engine room, boiler room, pump rooms and similar spaces.

Completely electrified equipment is used in galley, laundry, and refrigerator compartments. All dining facilities are aft to insure good service from galleys and pantries. Separate lounges and recreation rooms are provided for officers and crew. A modern hospital is located amidships, with an isolation ward for cases of the contagious type.

Fire-fighting facilities include the standard water and steam equipment. Four lifeboats, two of them motor driven, have been provided.

The S.S. Venore is built to Maritime Commission requirements and American Bureau of Shipping, highest class, under special survey.

HOT OFF THE PRESS

Production Management and how it affects productivity, costs and employments is a 40-page booklet published by Albert Ramond & Associates, New York, N. Y. Based on experience in over a thousand plants, the booklet covers work measurement, method improvement, labor cost and expense control, production control, job evaluation, incentive wage plans for production workers, indirect workers and supervisors, and labor's attitude toward increased productive efficiency. It includes 12 pages of pictorial diagrams and charts.

* * *

W. M. Kellogg Company have released a 32-page booklet covering oil refining by the new fluid catalytic-cracking process, alkylation and isomerization, hydro-forming and polymerization. The book contains photographs of various cracking units as well as diagrams showing the operation.

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Electronics Digest, the records of electronics at work, is a new publication by Westinghouse Electric Corp. that is planned for executives who must keep abreast of electronic developments as they affect industrial processes. It is a digest of material previously published in technical magazines and, as such, will enable management groups to keep abreast of modern trends in the use of this newest production tool.

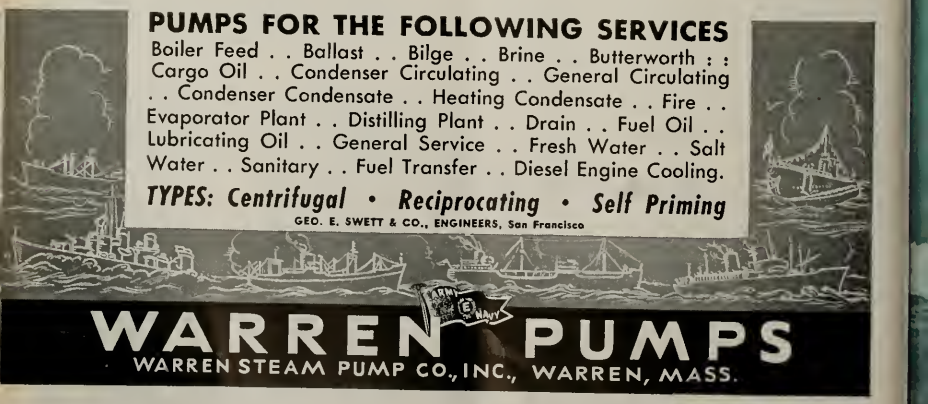
War Tugs Tell Their Tales of the Sea is a folio of astounding exploits performed by war tugs of the United Nations, which comprise a brilliant chapter in marine history. It is put out by the Cleveland Diesel Engine Division of General Motors Corporation.

Powell Valves for Corrosion Resistance is the title of a new booklet by Wm. Powell that briefly describes and illustrates a number of their complete line of valves, which are available in a wide selection of pure metals and special alloys for corrosion service.

M. L. Bayard and Company has issued Bulletin A-100, describing a new remote mechanical control system. Specifications and capacity charts are given for the universal shaft assembly, steady shaft assembly, and bevel gear assemblies. Also there are layouts covering such uses as opening or closing large valves, ventilators, banks of windows, or in conjunction with such equipment as cranes, windlasses, winches and steering gear.

"Bailey Thermo-Hydraulic Feed Water Regulators," Bulletin No. 83-C, was recently published by Bailey Meter Company. It describes and illustrates improved designs of thermo-hydraulic generators and bellows-operated feed water regulator valves, suitable for feed lines ranging in size from ¾" to 6" inclusive. Also available is Bulletin No. 62, featuring Bailey open channel meters for sewage, industrial wastes, sludge, and irrigation water. The meters are of both the direct mechanical and the electronic telemeter type.

Texaco Development Corporation, a subsidiary of The Texas Company, recently released a booklet entitled "The Story of the Penetron." The Penetron is an instrument for measuring the density, thickness and other desired characteristics of materials by means of reflected gamma rays. The booklet explains the principle of operation, complete with charts, methods of determination of liquid level and specific gravity of fluids, as well as a description of the individual parts.



Pacific MARINE REVIEW

DECEMBER, 1945



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PUBLISHED AT 500 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA
LOS ANGELES OFFICE . . . . . 816 West 5th Street, Zone 13. Telephone Michigan 3129
Entered as second class matter June 20, 1913, at the Post Office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th.



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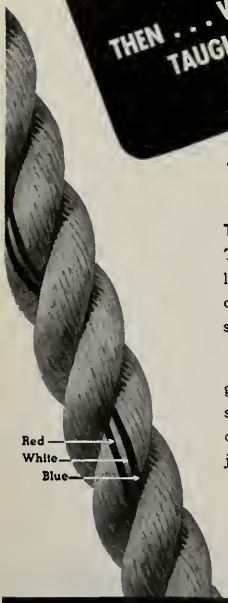
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In the early days of the war, Nylon tow rope was shortlived because it kinked and whipped. The success of great invasions by the Airborne infantry depended upon stabilizing the tow rope.

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The National Federation of American Shipping

Pacific MARINE REVIEW

Shipowners and the organizations representing the marine industry of the United States have endured a considerable amount of rather caustic criticism and "needling" recently because of alleged "lethargy, timidity and confusion."

Propeller Clubs and other organizations are accused of "smugness and complacency" at times when the industry they were organized to promote is threatened by many dangerous shoals and reefs along its uncertain course.

We believe that this criticism insofar as it has constructive intent may be very beneficial for the industry. And we also believe that a unified department of public relations for the American shipping industry would be of very great help in creating public interest in shipping and in guiding the simplification of Government controls.

We further believe that the National Federation of American Shipping can be made such an agency and that the American shipping industry should stand solidly back of this Federation. Before the war, the ship operators of the Pacific Coast had become a fairly unified group in all matters relating to their common interests. In labor disputes, in accident prevention, in public relations, they have a unified front. The one man chiefly responsible for this was Almon E. Roth, who is now president of the National Federation. If the ship operators of America give the Federation and its president an enthusiastic united support it will be possible for the marine industry to exercise maximum influence at Washington for a wise program of American merchant marine development.

At the November meeting of the Propeller Club, Port of San Francisco, Samuel Schell of the Maritime Commission called attention to the lack of interest displayed by Congress in maritime legislation. He indicated several adverse trends:

(1) The great expansion probable in Army and Navy post-war transport service.

(2) Low cargo rate structures.

(3) Apathy of the great interior sections.

He suggested a permanent conference of steamship executives.

All of these adverse features and many more that we could enumerate are naturally the constant problems of an industry-wide body like the National Federation.

The American Merchant Marine Conference at its 19th Annual Meeting, New York, October, 1945, passed several pertinent resolutions of which the following is an abstract.

(1) That steamship companies are entitled to air certificates of convenience and necessity without discrimination upon a proper showing before the Civil Aeronautics Board.

(2) Urges the continuance of a long range annual building program of merchant ships and a naval replacement program to keep Navy and merchant marine up to date.

(3) Urges the return of non-discriminatory multilateral trade throughout the world

(4) Urges that national laws pertinent to merchant marine operation be formulated or modified to encourage the ship operator to employ research facilities to the full.

(5) Urges the adoption of appropriate amendments to the Interstate Commerce Act to prevent discrimination against coastwise and intercoastal water carriers.

(6) Urges that port facilities be returned to former peacetime ownership.

Here again is material for the National Federation and also the support of the Maritime Conference for the National Federation program. Most of these resolutions bear favorably on actions which the Federation was already actively promoting.

WITH THE NAVAL ARCHITECTS AND MARINE ENGINEERS

Convention Papers Reviewed by A. J. Dickie

THE FIFTY-THIRD ANNUAL MEETING of the Society of Naval Architects and Marine Engineers convened November 14-17 at the Waldorf-Astoria Hotel, New York, N. Y., to discuss technical and other subjects immediately affecting the maritime industry.

Following the Council Meeting November 14, the First General Session met on Thursday, November 15, at 9:30 A.M., in the Jade Room for the President's Address and the Annual Report of the Secretary-Treasurer. This was followed immediately by the presentation of two technical papers; Paper No. 1, "Economic Features of Low Pressure Evaporating and Distilling Plants for Merchant Ships," by Mark L. Ireland, Jr., Associate Member, and Paper No. 2, "Experiences with Merchant Ship Propulsion Machinery in War," by Daniel S. Brierley, Member.

The Second Session met in the afternoon at 2:00 o'clock, for discussion of Paper No. 3, "Cargo Handling and Its Relationship to Overseas Commerce," by Arthur C. Rhon, Member, and Paper No. 4, "Adaptations of the Basic Liberty Design," by E. B. Williams, Member.

The Third Session was held at 9:30 A.M., Friday, November 16, with the presentation of Paper No. 5, "The Ore Carrier S. S. Venore," by Harold F. Robinson and Eugene P. Worthen, Members; and Paper No. 6, "A Marine Gas Turbine Plant," by C. Richard Soderberg and Roland B. Smith, Members, and Lieutenant Commander Ashton T. Scott, U.S. N.R., Visitor. Paper No. 7, "Large Passenger Carrying Ships for Certain Essential Trade Routes," by James L. Bates, Member, was presented in the afternoon at 2:00 o'clock.

The Fifty-third Annual Banquet was held in the Grand Ballroom Friday evening, November 16, preceded by the usual reception for distinguished guests and officers of the Society.

President's Address

William S. Newell, retiring president, declared the Society to be in a healthy and sound state with a membership of 4200 and its finances in excellent condition. Since 1934 there has been a gain of 2650 members (170 per cent). He reviewed the history of shipbuilding and marine engineering during the fifty-two years of the Society's existence and reminded the members that it was exceedingly important now to make wise decisions on future courses of action. As an effort to that end he proposed the following:

"A Joint Shipping Industry Committee, a small one, consisting of a member from each of the following: The Association of American Ship Owners, the Shipbuilders Council of America, The National Federation of American Shipping, Inc., The American Merchant Marine Institute and The Society of Naval Architects and Marine Engineers, and also two members selected to represent labor. These seven members to select an eighth member, who will be chairman of the Committee and who will give his full time to the work, his compensation to be fixed by the seven committee members, and the entire costs of operation to be divided among the groups from which the committee members are chosen. As I have just said, we must do something beyond talking.

"I strongly advocate Basil Harris' proposal as to the need and the urgency of a new cabinet position; namely, a Secretary of Transportation. It may well be that if a joint committee is formed, as recommended, the establishing of such a new cabinet position would be its first objective."

Technical Papers

The papers presented at the technical sessions were all interesting and timely. Four of the seven papers are on purely marine engineering subjects and the other three are naval architecture, combined with marine engineering. We are abstracting all of them for the convenience of our readers.

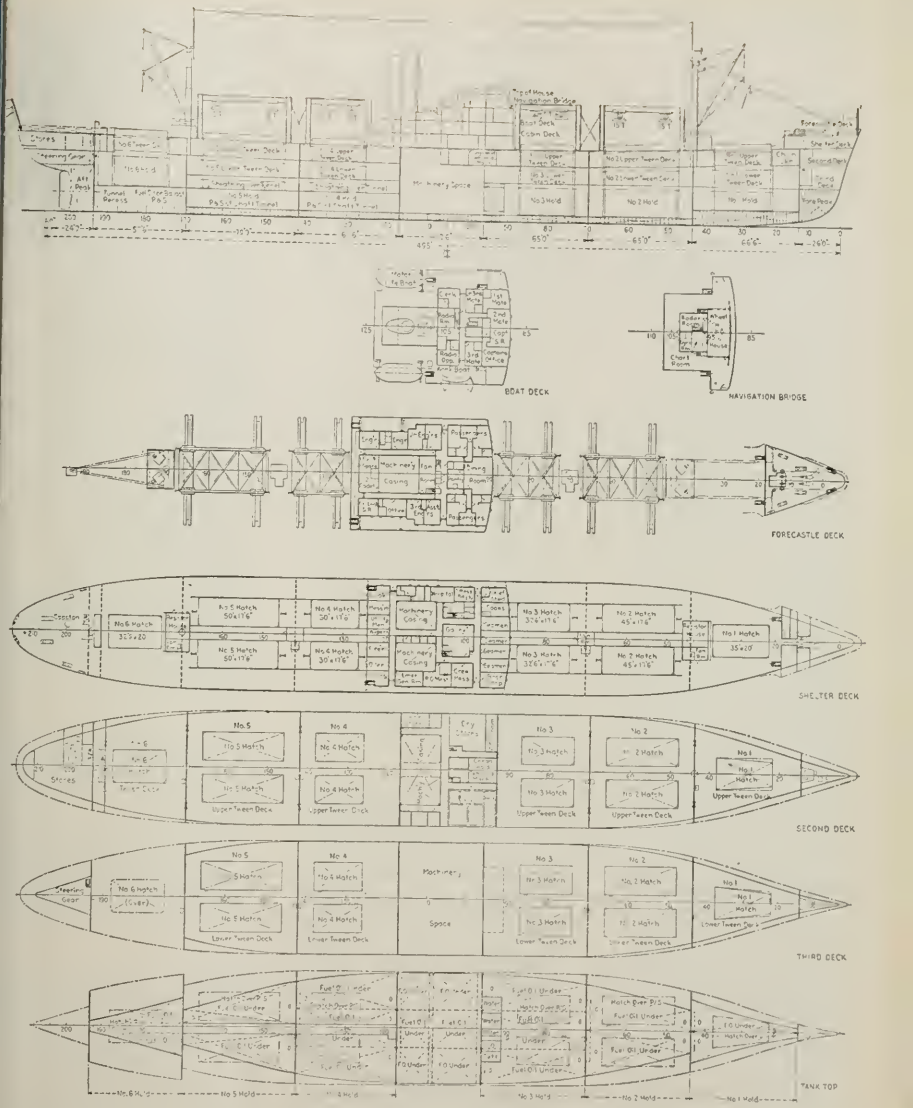
I

Economic Features of Low Pressure Evaporating and Distilling Plants for Merchant Ships, by M. L. Ireland, Jr. Mr. Ireland is connected with the Engineering Technical Division of Newport News Shipbuilding and Dry Dock Company.

Low pressure evaporating plants of large capacity are much in the minds of designers of post-war ships. This paper investigates the desirability of such installations from the economic point of view using for analysis four types of vessels ranging from a cargo vessel through three types of passenger vessel having capacities of 100, 800 and 1200 passengers.

The main economic advantage is due to elimination of fresh water tankage and the use where possible of the extra capacity for carriage of paying freight. It is shown that each case must be carefully examined to determine whether such installation would show a gain or loss in operating revenue when compared with the cost of installation and its operation and maintenance. In Mr. Ireland's analysis the cargo vessel shows a loss both for long and short voyages while the larger passenger vessels show a very good gain in net operating returns.

Particularly in the case of passenger vessels visiting foreign ports there are reasons other than the economics of operation for installing large capacity evaporating and distilling plants. One is the added safety from the health viewpoint of always furnishing distilled water of known



Inboard profile and deck plans of proposed ship with overhead cargo gear.

purity. Properly publicized, this feature might bring larger passenger business.

II

Experience with Merchant Ship Propulsion Machinery in War, by Daniel S. Brierley. Mr. Brierley is Director, Division of Maintenance and Repair, United States Maritime Commission, and is therefore in a position to know whereof he speaks.

The purpose of this discussion is, "to set forth the pertinent and major machinery operating, maintenance, and repair experiences encountered by our merchant fleet during the war period based on the information available and without reference to instances involving enemy action or marine casualties."

Boilers have presented many major breakdowns principally due to inability to maintain peacetime practice under wartime conditions. Soot blowers could not be operated regularly under convoy conditions. Fuel oil and spare feed water had to be taken at out ports previously unknown to American shipping. Inexperienced personnel had to cope with these disadvantages. On emergency-type cargo vessels there were many failures of the bottom row circulating tubes, due to clogging by scale and overheating. Some instances of large carry-over of lube oil were recorded but many more of gradual seepage of oil into feed water. Furnace lining gave much trouble. Some superheater and air heater elements recorded failures. However there was a "tremendous number of economizer failures in merchant vessels so equipped." This was largely due to leakage caused mainly by faulty fabrication or poor design. The original design of the boilers fitted with economizers did not provide for any other entrance of feed into the boiler and much time and discussion were required to get clearance for installing economizer by-passes.

Wartime conditions of shipyard work are the main cause of troubles with turbine installations, coupled with poor design of over-speed governors in some instances. Oddly enough, the bulk of the major turbine troubles occurred in turbo-electric propulsion units. Wiped bearings leading to complete wrecking of turbine and generator have been experienced. Another danger is the presence of foreign materials in the lube oil sumps or tanks, or in the main steam lines. "Welding rod, bolts and nuts, washers, rags and waste" are a few samples of the types of material found.

Gear trouble was largely confined to cast steel gearing and to gears of foreign manufacture.

Reciprocating Engines

The steam triple expansion engines of the emergency type of cargo vessel recorded an average maintenance cost comparing very favorably with commercial experience using this type of engine. The writer suggests that the engine should have forced lubrication only in the H.P. cylinder to eliminate the carry-over of lube oil into the hot well which has caused so much trouble in the boilers on the Liberty type ships.

Diesel engines recorded their most serious operating trouble in crankcase explosions which the technical and the maintenance division of the U.S.M.C. are still studying and for which they as yet have no very definite answer.

Electrical equipment, pumps, heat exchangers, refrigerating machinery, are all treated from the maintenance viewpoint and the result is a very valuable record which will be of great interest to the technical divisions and the port engineers of all ship operating firms.

III.

Cargo Handling and Its Relationship to Overseas Commerce, by Arthur C. Rohn. Mr. Rohn is chief engineer of U.S.M.C. at Washington, D.C.

He points out first the relative economic importance of cargo handling costs. In 1929 our foreign trade general cargo amounted to "28,000,000 tons." "This impressive figure becomes colossal when it is realized that the greater portion of it was **worked by hand** not once but several times on our wharves and piers. In all material handling problems in industry the guiding precept lies in the statement that 'economical movement of goods is secured only by **not** handling them.'

"A Liberty ship loaded full and down on a 1000-mile voyage shows better than 50 per cent of the total voyage costs devoted to cargo working. The same ship on a 12,000-mile voyage shows 18 per cent for cargo working."

During this century the voyage cost per ton of carrying cargo at sea has been reduced by over 33 per cent. Cargo handling costs on general cargo have remained stagnant over the same period. On a C-3 type cargo vessel a 25 per cent increase in cargo handling speed with the same number of men employed would reduce direct labor cost by $69,800 and increase net profit by 2.91 per cent. This would be equivalent in dollars to reducing specific fuel consumption from 0.6 pounds to 0.2 pounds shp hour. The indirect savings due to quicker turn-around might allow seven ships to do the work now done by eight and each of the seven carry more tonnage per year than each of the eight formerly carried.

For arriving at these very desirable results, the paper proposes engineering study for improvements in six divisions:

(a) Packaging, including container stowage.
(b) Port Facilities and Organization.
(c) Pier Design and Equipment.
(d) Hatches of Ships.
(e) Holds of Ships.
(f) Cargo Gear of Ships.

The inboard profile and deck plans herewith show a proposed answer to (d), (e) and (f). The equipment will be a great improvement on the overhead gear now in use on the Sea Hawk.

IV

Adaptations of Basic Liberty Design, by E. B. Williams. Mr. Williams is vice president, Delta Shipbuilding Company, Inc., New Orleans.

The purpose of the paper is to record two major redesigns of the basic Liberty type, namely the tanker and the collier types. Complete general arrangement plans and pictures are given of both types.

V

The Ore Carrier S.S. Venore, by Harold F. Robinson and Eugene P. Worthen. The authors are respectively naval architect and chief engineer of the Central Technical Department, Bethlehem Steel Company, Shipbuilding Division, Quincy, Mass.

The paper is a very thorough treatment of the design, and the official trials of the first post-war ore carrier for the Sparrows Point, Md.–Chile run of the Bethlehem Steel Co.

Item	Rating	Manufacturer
Design conditions at normal shaft horsepower		
Steam conditions		
Turbine throttle	1400 lb G, 741 deg F	
Inlet to intermediate pressure turbine	185 lb G, 905 deg F	
Inlet to low pressure turbine	15 lb G, 563 deg F	
Main condenser pressure (75 deg F sea)	1.5 in. Hg abs.	
Feed temperature to boilers	375 deg F	
Propulsion turbines		
High pressure turbine		
Type	Impulse reaction	Bethlehem
Shaft horsepower	24681	
Revolutions per minute	6455	
Mean blade speed, last row	340 ft per sec reaction	
No. of stages	1 impulse—two reaction	
Intermediate-pressure turbine		
Type	Reaction	
Shaft horsepower	3103	
Revolutions per minute	4462	
Mean blade speed, last row	300 ft per sec	
No. of stages	25	
Low pressure turbine		
Type	Reaction	
Shaft horsepower	4581	
Revolutions per minute	2462	
Mean blade speed, last row	580 ft per sec	
No. of stages	17	
Astern turbine		
Type	Impulse	
No. of stages	2	
Reduction gear		
Type	Double helical, double reduction rotated	Falk Corporation
	Pitch Face	
	Diameter (effective) Rpm	
Low-speed gear	167.72 in. 31.75 in. 95	
Low-speed pinions, high-pressure	17.5 in. 911	
intermediate-pressure	17.5 in. 911	
low pressure	22.25 in. 741	
High-speed gears	51.533 in. 21.25 in.	
High-speed pinions, high pressure	7.25 in. 1455	
intermediate-pressure	10.5 in. 1460	
low pressure	14.5.89 in. 2482	
High-pressure reheater		
Type	Horizontal, single U-tube pass	Foster Wheeler Corporation
No	1	
Surface	1840 sq ft	
Propulsion steam, inlet	185 lb G, 2 per cent moisture	
outlet	563 deg F	
Heating steam	1410 lb G, 740 deg F	
Low-pressure reheater		
Type	Horizontal, single U-tube pass	Foster Wheeler Corporation
No	1	
Surface	2358 sq ft	
Propulsion steam, inlet	15 lb G, saturated	
outlet	563 deg F	
Heating steam	1440 lb G, 740 deg F	
Main condenser		
No.	1	Bethlehem
No. of passes	1	
Surface	30,840 sq ft	
Length between tube sheets	13 ft 6 in.	

* Data for propulsion turbines based on normal rating.

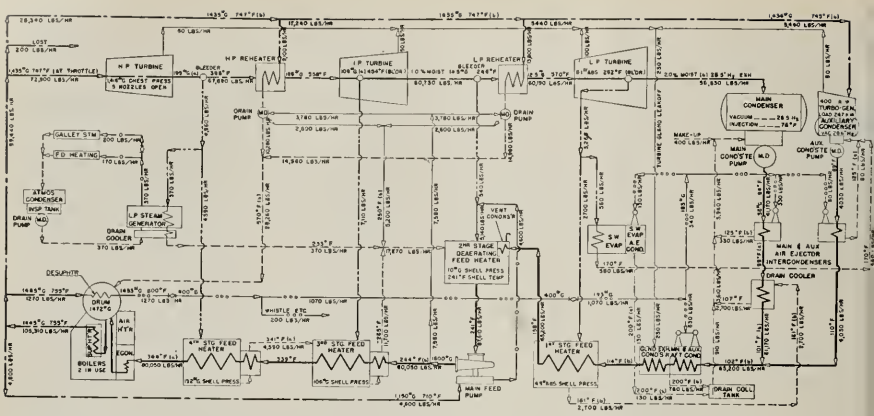
Item	Rating	Manufacturer
Reheater drain pumps		
Type	Single-stage, centrifugal, motor driven	Byron Jackson Company
No	2	
Capacity	80 gpm	
Total head	75 lb	
Motor horsepower	7.5	
Boiler test pump		
Type	9 in. × 11½ triplex plunger, motor-driven	Union Steam Pump Company
No.	1	
Capacity	11½ gpm	
Discharge pressure	2340 lb G	
Motor horsepower	2	
Lubricating-oil service pumps		
Type	Rotary screw, motor-driven	Quimby Pump Company
No	2	
Capacity	475 gpm	
Discharge pressure	135 lb G	
Motor horsepower	30	
Fuel-oil service pumps		
Type	Rotary screw, motor-driven	Quimby Pump Company
No	2	
Capacity	18 gpm	
Discharge pressure	300 lb G	
Motor horsepower	6	
Fuel-oil transfer pumps		
Type	Rotary screw, motor-driven	Quimby Pump Company
No	2	
Capacity	225 gpm	
Discharge pressure	40 lb G	
Motor horsepower	15	
Fuel-oil heater cleaning compound circulating pump		
Type	Single-stage, centrifugal, motor-driven	Warren Steam Pump Company (pump)
No	1	General Electric Company (motor)
Capacity	8 gpm	
Total head	15 lb	
Motor horsepower	½	
Low-pressure feed pump		
Type	Turbine-type, motor-driven	Pomona Pump Company (Wesco)
No	1	
Capacity	80 gpm	
Discharge pressure	140 lb G	
Motor horsepower	4	
Low-pressure feed pump		
Type	7½ × 5 × 6 horizontal duplex double acting	Warren Steam Pump Company
No	1	
Capacity	42 gpm	
Discharge pressure	135 lb G	
Low-pressure feed heater		
Description	Horizontal straight-tube combining air ejector and gland exhaust condensers, drain cooler and first-stage feed heater	Bethlehem
No	1	
Steam pressure	5.1 lb abs	
Temperature rise feed	92 deg F to 155 deg F	
Second-stage feed heater		
Description	Deaerating, direct-contact	Worthington Pump and Machinery Company
No	1	
Steam pressure	15 lb G	
Feed outlet temperature	250 deg F	
Third-stage feed heater		
Description	Closed, two U-tube pass	Bethlehem
No	1	
Steam pressure	84 lb G	
Feed outlet temperature	314 deg F	
Fourth-stage feed heater		
Description	Closed, two U-tube pass	Bethlehem
No.	1	
Steam pressure	190 lb G	
Feed outlet temperature	370 deg F	
Fuel-oil heaters		
Description	Sectional, fin-tube	Griscom-Russell Company
No.	2	
Capacity, each	2340 lb per hr	
Temperature rise	90 deg F to 230 deg F	
Steam pressure	140 lb G	
Lubricating-oil coolers		
Description	Single pass, straight-tube	Bethlehem
No.	1	
Capacity, oil	425 gpm	
Temperature drop (85 deg F sea)	120 deg F to 100 deg F	
Low-pressure steam generator		
Description	Horizontal, submerged, Bethlehem straight-tube with drain cooler	
No.	1	
Capacity	20,000 lb per hr	
Shell pressure	125 lb G	
Coil pressure	350 lb G	
Atmosphere condenser and hotwell		
Description	Horizontal, two-pass, straight-tube	Bethlehem
No	1	
Gland leak-off exhauster		
Type	Centrifugal motor-driven fan	American Blower Corporation
No.	1	
Capacity	150 cfm	
Suction head	6.65 in. H_2O	
Motor horsepower	¼	
Lubricating oil purifier		
Type	Centrifugal, motor-driven with attached pumps	DeLaval Steam Turbine Company
No	1	General Electric Company (motor)
Capacity	300 gal per hr	
Motor horsepower	2	
Lubricating-oil heater		
Type	Plate	General Motors Corporation
No	1	
Capacity	300 gal per hr	
Temperature rise	100 deg F to 160 deg F	
Steam pressure	125 lb G	
Oil and water separator		
Type	Gravity	Bethlehem
No	1	
Capacity	50 tons per hr	

Item	Rating	Manufacturer
Boilers		
Description	Two-drum bent-tube with economizer, air heater, water walls, air casing, combustion control	Combustion Engineering Corporation
No	2	
Superheater outlet pressure	1450 lb G	
Superheater outlet temperature	750 deg F	
Designed efficiency at normal shaft horsepower	88 per cent	
Generating surface, total	39,000 sq ft	
Superheating surface	9961 sq ft	
Economizer surface	33,881 sq ft	
Air heating surface	44,000 sq ft	
Furnace volume	8700 cu ft	
No. of burners	4	
Total evaporation per boiler (max.)	60,000 lb per hr	
Corresponding fuel rate (18,500 Btu per lb)	3.422 lb per hr	
Main generators		
Type	240 volt direct-current, 2-wire geared turbine driven	General Electric Company
No.	2	
Capacity, each	400 kw	
Water rate (1101 per cent load)	12.2 lb per kw per hr	
Emergency generators		
Type	120-volt and 240 volt direct-current, 2-wire, Diesel-driven (2 generators, 3 engine)	Caterpillar Tractor Company (Diesel) General Electric Company (generator)
No.	1	
Capacity	5 kw (120 v), 25 kw (240 v)	
Lighting motor generators		
No	2	Crocker Wheeler Electric Manufacturing Company
Capacity, each	25 kw	
Voltage	230/120 d-c	
Forced-draft blowers		
Type	Motor-driven centrifugal	American Blower Corporation
No	2	
Capacity	14,000 cfm	
Head	14 in. H_2O	
Motor horsepower	60	
Main air ejectors		
Type	Twin 2-stage	Foster Wheeler Corporation
No	1	
Capacity	65 lb per hr saturated air	
Suction pressure	1 in. Hg abs	
Suction temperature	71.5 deg F	
Main circulating pump		
Type	Single-stage, centrifugal, motor-driven	Ingersoll-Rand Company
No	1	
Capacity	12,000 gpm	
Total head	15 feet	
Motor horsepower	80	
Main feed pumps		
Type	14-stage, centrifugal, turbine-driven	Byron Jackson Company (pump) General Electric Company (turbine)
No	2	
Capacity	200 gpm	
Total head	1600 lb	
Brake horsepower	360	
Fuel feed pumps		
Type	11½ × 4 triplex plunger, motor-driven	Worthington Pump and Machinery Company
No	1	
Capacity	27.5 gpm	
Discharge pressure	1550 lb G	
Motor horsepower	30	

Machinery particulars.

This vessel is chiefly remarkable in that she has the highest pressure steam plant of any American vessel, viz. 1450 psi at superheater outlet.

In our November issue we published general particulars, arrangement plans and trial results of this ship, so here we will confine the review to some particulars of the steam power plant. The overall economy of this vessel is such that "expressed in simple terms she carries 24,000 tons of



Heat balance diagram of S.S. Venare.

cargo at a speed of 16 knots on just a little more than one barrel of oil per nautical mile."

Particulars of the main units of the propulsion plant are given in the table reproduced herewith.

VI

A Marine Gas Turbine Plant, by C. R. Soderberg, R. B. Smith, and Lt. Comdr. A. T. Scott, U.S.N.R. These authors are respectively: Professor Mechanical Engineering, M.I.T.; Vice President, Engineering, Elliott Company; and Associate in Research and Standard Branch, Bureau of Ships, U. S. Navy.

The paper describes, illustrates and presents test data on the 2500-hp marine gas turbine built by the Elliott Company for the Bureau of Ships, U. S. Navy. This unit is being operated as a test turbine and studied carefully to iron out all "bugs" and to improve the efficiency and economy. The plant was described in considerable detail in a recent issue of Pacific Marine Review. The author's "conclusion" is interesting:

"This development is only the beginning; there are a great many problems to be solved before the gas turbine becomes an established prime mover. With the confidence gained through the successful operation of this plant, there is every reason to expect that these problems will be attacked with vigor and intelligence. The incentive should be even greater, for recent metallurgical developments open new possibilities for advances in the operating temperature, with resulting improvements in efficiency and reduction in size. While far from perfect, the Elliott gas turbine has given encouraging results, and it has paved the way for the three additional units now under construction."

VII

Large Passenger-Carrying Ships for Certain Essential Trade Routes, by J. L. Bates. Mr. Bates is the Director of the Technical Division, U. S. Maritime Commission, Washington, D. C.

This paper touches on some war lessons from experience with large passenger liners. This type in World War II has proved valuable only for transport of troops and has not been practical for either carrier or auxiliary cruiser work. After an analysis of passenger business prospects postwar, the paper goes on to an outline description of the vessels proposed for the various essential trade routes. The largest of these vessels is the design for the Pacific Coast transpacific run to East Asia ports and Manila. We reproduce herewith the inboard profile of this vessel and her midship section. Of this design the author says:

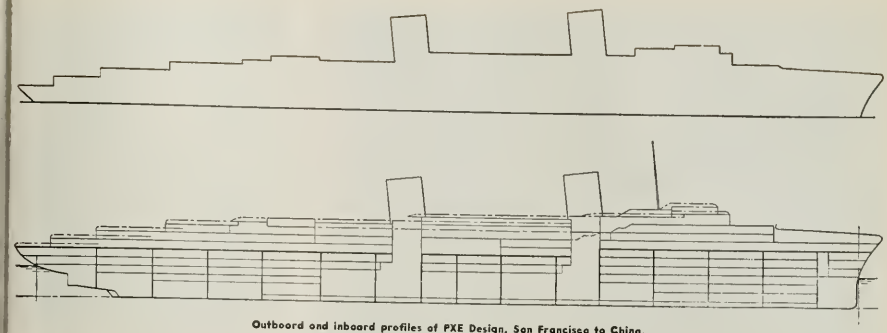
Careful comparison of several types based upon economic studies indicated that two large 29-knot vessels would be satisfactory. Accordingly, the detail investigations have been devoted to ships of this type.

Sufficient fuel tankage is provided for the round trip of approximately 14,500 miles at the design mean sea speed of 29 knots. Because of this generous provision of fuel, the deadweight of this ship is relatively large for the high speed anticipated.

In order to hold the shaft horsepower to a reasonable figure, as well as to be able to operate on a moderate consumption of fuel oil, the length of the proposed vessel has been brought to somewhat less than 900 feet.

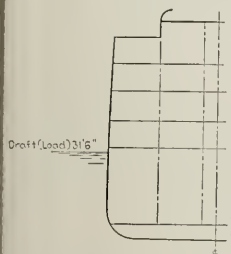
The great length previously referred to and the relatively small beam (about 85 feet) are both conducive to the provision of outside stateroom accommodations. Moreover, this beam is sufficient to insure a satisfactory period of roll.

In this ship it is proposed to depend on numerous side ports, each adequately served by a new type of cargo-handling gear to load and discharge cargo.



Outboard and inboard profiles of PXE Design, San Francisco to China.

No attempt has been made to use twin skegs in this design. Experience with model basin tests in the Washington tank indicates that with long very fine ended vessels the advantages accruing from twin skegs in fuller forms are appreciably decreased. Some study has been given to the use of twin rudders. It may be that their advantages are sufficient to warrant their installation but the final decision will depend upon further study.



Midship section of PXE Design.

The transpacific design is of much greater length than either of the others. Therefore, it appeared possible to place both machinery compartments at about the after third point. This location has the double advantage of reducing the length of propeller shafting and placing the stacks far enough aft so as to obviate most of the smoke nuisance. However, investigation of damaged stability showed that the three-compartment standard required in a vessel of this length might not be obtained so satisfactorily with the machinery aft as with it amidships. The decision will depend upon the results of further study.

	"A" New York to Western Europe	"B" New York to East Coast So. America	"C" New York to Mediterranean Ports	"D" San Francisco to China and Philippines	"E" San Francisco to Australia
Length of waterline, ft.	745	699	650	895	628
Beam, ft.	90	71	89	85	79
Depth to strength deck, ft.	70.5	56.5	62	71	61
Longitudinal coefficient	0.598	0.57	0.616	0.57	0.658
Displacement (design), tons	33,500	22,750	30,000	37,500	26,140
Weight (tons), fuel oil	4,000	5,200	5,400[a]	9,500	6,666[b]
Fresh water	750	500	670	800	2,869[a]
Swimming pools	100	100	100	200	100[a]
Passengers and baggage, crew, provisions	800	450	650[a]	1,000	650[a]
Dry cargo	6,220	2,100	5,050[a]	1,350	3,100[a]
Reefer cargo	530	400	500[a]	150	450[a]
Total deadweight	12,400	8,750	12,380	13,000	11,300
Speed, knots	24	27	22	29	20
Shaft horsepower	55,000	60,000	37,000	100,000	22,000
Radius (designed), miles	8,000	11,000	12,500	12,500[a]	16,600[a]
No. of passengers	1,200	560	678	1,000	700
No. of crew	669	449	417	496	360
Bale cubic (holds and trunks)	450,800	206,800	477,000[a]	150,000	245,000
Reefer cubic	53,000	44,500	51,800	18,000	39,000

[a] Maritime Commission estimate. [b] Topping off at Honolulu. [c] Full tankage.

Characteristics of proposed passenger vessels for certain trade routes.

Damage Control

Demonstration for Northern California Naval Architects And Marine Engineers

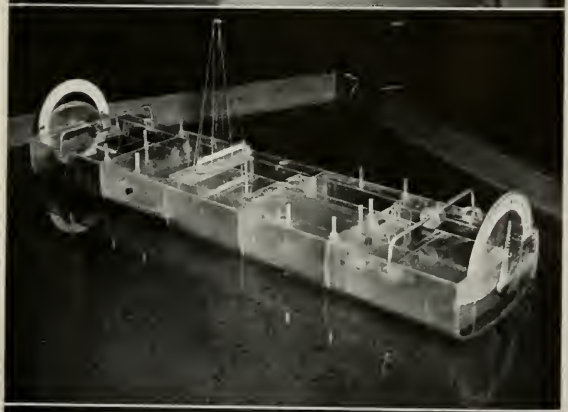
The Navy's Damage Control School in San Francisco played host to the Society of Naval Architects and Marine Engineers, Northern California Section, on November 15, 1945. The feature of the meeting was the exhibition of damage control films and demonstrations to a civilian group for the first time since Pearl Harbor.

A synopsis of a paper on "Damage Control" was read by Lt. Comdr. R. B. Westgate, USNR, which dealt with the problems of building damage resistant ships. Points brought out were:

(1) Correct Liquid Loading. In order to preserve maximum stability, the problem of liquid loading must be one which is familiar to the ships' officers. Tanks should be filled in such a way that free surfaces of liquid are eliminated wherever possible. Proper liquid loading will insure adequate stability and reduce the angle of list after damage. In addition to their stability feature, filled tanks give protection in case the ship is hit, and after the hit the blast effect is cut down. A multiplicity of longitudinal wing tanks also tend to hold the ship together in case of damage.

(2) Weight Control. The Navy has adopted a load line marking similar to the American Bureau's Plim-







soll Mark, and the ship's draft is limited by this mark. It is an important feature of damage control that too much weight be not brought onto the vessel, weight which will undoubtedly impair stability. Added weight cuts down reserve buoyancy.

(3) Watertight Integrity. A program of damage resistance is based upon compartmentation, for it is only by compartmentation that flooding can be controlled. Watertight compartments aboard naval vessels are continually tested to see that they are watertight so that if any such compartment should receive a hit, flooding could be isolated to that compartment and not impair the operation of the ship elsewhere.

(4) Maintaining Equipment. Each ship has equipment such as fire lines, fire extinguishers, emergency tools, shores, wedges and strongbacks, as well as medical equipment, which must be kept in constant order and be prepared for any emergency.

(5) Organization and Training of Personnel. It is necessary that the damage control party be schooled in its procedure should disaster strike. The entire ship's crew may be called upon to aid in damage control. A vigilant training in this activity is essential to the preservation of the ship.

A British Navy film entitled "A Story of Seven Sailors" stressed point No. 5 above. It illustrated how a ship was unnecessarily put out of action by a small hit due to carelessness of its crew, who failed to dog down watertight doors and hatches after use, and failed to clean up gear and oil upon completion of a small routine task.

An exhibition of damage control and compartment flooding was given by Lt. Commander D. E. Morganroth, USNR, with the aid of a tank and two models, one made of plexiglass, and the other made of sheet

Top: Meosuring the inclining mament. Lieut. Comdr. Morgenrath hos his hand on the meosuring instrument.

Center: Plastic model showing inclining pendulum in positian ready for inclining experiment.

Bottom: Plastic section of vessel inclined as o result of placing on board o rectangular shaped vessel containing o considerable volume of free water.



Lieut. Comdr. D. E. Morgenroth.

metal to represent the cruiser U.S.S. Northampton, which was lost in the early part of the war.

The plexiglass model was used to illustrate the effects of "free surface" versus fixed ballast. Initial stability was demonstrated by controlling (1) location of free surface, and (2) amount of free surface. Action of the ship and its liquid ballast was readily viewed through the transparent hull, allowing the spectator to view his problem as he never could on a full size ship.

Compartmentation flooding was illustrated with the aid of the model cruiser. The 12-foot ship was constructed with internal watertight compartments which were all valved off from each other. Flooding was accomplished by opening the little ship's sea valves and compartment valves by use of a tiny reach-rod which gave the demonstrator ready access to the control of any valve in any compartment. By flooding the Northampton compartment by compartment as her prototype had been flooded when torpedoed by the Japanese, the model capsized in much the same manner as her real-life parent.

The Navy certainly has simplified the problems of stability and damage control with the use of these models. They were used during the war, as they will be afterwards, to explain these problems to students readily and augment their technical learning with illustrative experimentation.

Navy Board on Welded Ships Makes Second Interim Report

A Navy board of investigation convened by order of the Secretary of the Navy to inquire into the design and methods of construction of welded steel merchant vessels reported that no vessels have been lost due to hull fractures since the First Interim Report of the Board compiled one year ago, although of a total of 4063 ships launched, 722 of them sustained fractures. This is as compared with 432 fractures out of a total of 2993 ships as reported in the First Interim Report of 1944.

Of this total five Liberty ships which suffered serious fractures had to be abandoned and one of them broke in two. This was caused from a fracture near the forward corner of hatch No. 3. Pointing out that square corners very frequently act to initiate cracks, the board says that such corners are to be rounded insofar as practicable, and in the case of the hatch corners, which are a proved source of difficulty, specific reinforcements are to be added. On new vessels, an improved corner reinforcement is being fitted during the construction period.

"Numerous structural alterations have been made through the combined efforts of the Navy, Coast Guard, American Bureau of Shipping, and U. S. Maritime Commission," the Board reported, "since the inception of the Board to investigate the methods of construction of welded steel merchant vessels." These included the elimination of a cut in the sheer strake of the Liberty ships in way of the gangway; freeing of the bulwark from the top of the sheer strake on the Liberty ships; and serrating the bilge keel on both the Liberty ships and T2 tankers. These structural alterations are intended to serve two purposes; namely, to eliminate as many crack starters as possible; and to introduce barriers to limit the progress of any crack which might start from an undetected origin.

The over-all strength of the hull girder was probably the first item suspected when the structural failure problem arose on the ships. Calculations were made to compare the over-all strength of the current Maritime Commission welded ship designs with similar vessels which had exhibited satisfactory performance in service. These calculations indicate that the over-all strength of the designs in question is equal to that of successful riveted vessels.

As a result of the Board's activities, a suggestion booklet for welders and welding leadermen has been made, and in citing specific instances of failures due to faulty welding, it outlined one dozen steps to insure sound welds. "It is not generally realized by workmen and supervisors of the various crafts connected with the welding of ships that a small fault in a weld, in a critical location in a ship, can result in serious fractures endangering the vessel," it was pointed out, and it was with this in mind that specific instances were cited and outlined in detail.

The Board also conducted full scale bending tests, a survey of research projects, and a survey of shipyard welding practices.

Constant attention has been given to the mass production of ships by the use of welding during the war, and it is the result of this Board that vital and revolutionary steps will be formulated to eliminate such failures as mentioned above in the future. As a result of the Board's work, it is apparent that these methods of welding are here to stay in the post-war maritime world.

Members of the Board, appointed by the Secretary of the Navy, are Rear Admiral Harvey Johnson of the Coast Guard, chairman; Vice Admiral Howard L. Vickery, USN, Commissioner, U. S. Maritime Commission; Vice Admiral E. L. Cochrane and David Arnott, vice president and Chief Surveyor of the American Bureau of Shipping.



Motorship Emory Victory. 6000-shp Nordberg propulsion engines installed by Sun Shipbuilding & Dry Dock Co.

THE 6000-SHP DIESEL OF THE M. S. EMORY VICTORY



By R. W. Bayerlein

A 6000-SHP NORDBERG diesel engine recently completed its sea trial in the M.S. Emory Victory. It is the most powerful single acting diesel engine of its type ever built in America. It is built in nine cylinders, the cylinder bore being 29" and the stroke 40". It operates at a normal speed of 160 rpm. At this speed the rating is 6000 shp. The engine, however, is capable of delivering 10% continuous overload or 6600 shp at 165 rpm, and 25% overload for two hours or 7500 shp at 172 rpm.

It is of the two cycle type, with port scavenging and port exhaust, single acting, and fitted with crossheads. Mechanical injection of the fuel is used. The air for scavenging the cylinders is obtained by the use

(The text was read before the "Maritime Research" Panel of The Propeller Club of the United States at the Waldorf Astoria, New York City, on October 17, 1945. The author is manager of the Heavy Machinery Division, Nordberg Manufacturing Co., Milwaukee, Wisconsin.)

Cylinder tops of 9-cylinder 6000-shp Nordberg two-cycle diesel engine, M.S. Emory Victory.

f two separately motor-driven cen-rifugal blowers, furnishing the scav-nging air to the engine at approxi-nately 2½ lbs. per sq. in. pressure. 'wo blowers were decided upon, rst because of their favorable phy-cal dimensions, and second, it was ound that this method of obtaining ne scavenging air was the least ex-ensive and the simplest. It was de-ded to use the motor-driven blow-rs in order to obtain the shortest ngine possible and gain the maxi-ium accessibility to the working arts. In the event of failure of one lower, the engine is still capable of naintaining 70% ship speed with the ther blower operating.

Fuel Injection

The fuel injection system was de-eloped by the American Bosch Cor-oration in collaboration with Nord-erg engineers. The fuel pumps and uel injection nozzles are the largest f their type ever made in this coun-ry, and special consideration was iven to physical dimensions as well s to mechanical details. In the shop n the test stand with the engine onnected to a water brake for load bsorption the engine was tested for period of 360 hours on a continu-us endurance run developing 6000 hp at 160 rpm, immediately fol-owed by a 48-hour continuous run t 110% load, and followed by two ours at 125% load with correspond-ng increase in shaft speed. The fuel il used in these tests was 11.5 Baume t 60° F., averaging about 1100 .S.U. at 100° F. Heat value per ound was 18,345 btu. It was found est to keep the viscosity at the injec-ion nozzles between 150 to 200 .S.U., which required heating the uel to approximately 150° F.

This is an important development, s obviously the diesel engine must e in a position to burn heavy grades f fuel oil if it is to maintain a favor-ble operating cost position. On the hop test at full load of 6000 shp, nd operating at 160 rpm, with fuel orrected to 19,000 btu's per pound, he economy — not including the ower to drive the scavenging blow-rs—was .34 lbs. of fuel per shp hr., remarkably low fuel consumption, orresponding to a thermal efficiency f 39%. Fuel consumed per shp was ractically the same over the range of rom 2/3 power to full power. This as also borne out on the trials in the essel.

Reversing Gear

The reversing gear on this engine is unique, and has been reduced to its simplest form. The cam shaft is located overhead and drives the fuel cams operating the fuel injection pumps. The fuel injection lines, therefore, are very short from the pumps to the injection nozzles, and all of these lines are of equal length and interchangeable. This is very important for properly handling the fuel in the injection system. On a two cycle engine it is only necessary to place the fuel cams in either the ahead or astern position. No shifting of rollers over cam faces occurs in the design. It means that the cam shaft must only be revolved approximately 110° in order to place the cams in their proper timed positions for either ahead or astern running. A train of gears was introduced between the crank shaft and the cam shaft. The gear train consists of seven gears, including the driving gear, which is mounted upon the integrally flanged crank shaft coupling halves. The location of the drive is between the fifth and sixth cylinders near a node in the shafting system where the torsional amplitude is at a minimum. The reversing process consists of controlling the angular relationship between the cam shaft upon which the fuel cams are mounted and the crank shaft, through a four-gear reversing mechanism incorporated in this gear train. A very simple and inexpensive reversing mechanism is the result. It is fool-proof and trouble-free. The number of parts are at a minimum.

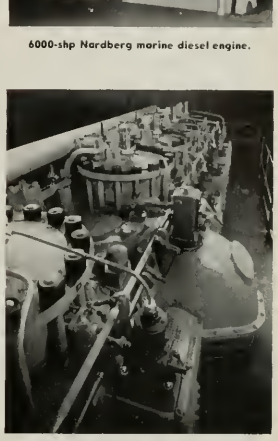
The crank shaft has 20″ diameter crank pins and main journals. It was made in two sections, each a single forging of one piece, one with five throws and the other with four throws. Complete it weighs 80,000 lbs.—40 tons. It is 41′ 2″ long.

The bedplate is cast in two sections. Each cylinder block is an individual casting fitted with a removable cylinder liner. Piston heads are cast steel and trunks cast iron. The piston heads are oil cooled. All wearing parts of the engine are renewable, and all such parts are readily accessible.

The weight of the engine proper including the thrust bearing is about 700,000 lbs. or 115 lbs. per horsepower. Cast iron is used for bases, frames, cylinder blocks and other heavy parts, and no particular attempt was made to reduce the weight beyond that which is accomplished by modern design and short cylinder-to-cylinder centers.

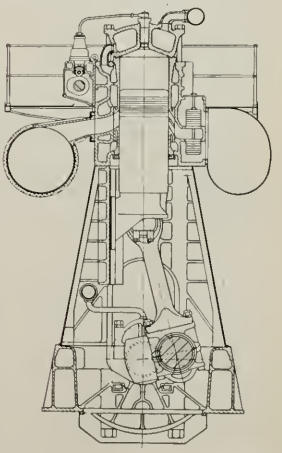


6000-shp Nordberg marine diesel engine.



6000-shp marine diesel engine, view at upper gallery.

The following preliminary figures obtained on the actual sea trial of the M.S. Emory Victory, which was conducted by the Sun Shipbuilding &



Dry Dock Co. on September 27, 28 and 29, 1945, are interesting.

At two-thirds power, and by torsion meter reading of 4180 shp, with the engine operating at 147.9 rpm, the pounds of fuel consumed per shp hr. was .345. At 100% power, with the torsion meter reading 5,942 shp, engine turning at approximately 165 rpm, the pounds of fuel consumed was .353 per shp hr. At 110%, or 6660 shp, by torsion meter and the engine operating at 170 rpm, the fuel consumption was .355 lbs. per shp hr, and 125% load, or 7375 shp, by torsion meter with engine operating at 174.5 rpm, the fuel consumption was .36 lbs. per shp hr. In this connection I should like to mention that the fuel oil used for these tests was around 500 S.S.U. at 100° F. As I mentioned before, these are preliminary figures, no correction having been made for fuel meter calibration. The high heat value of the fuel was approximately 19,000 btu per lb.

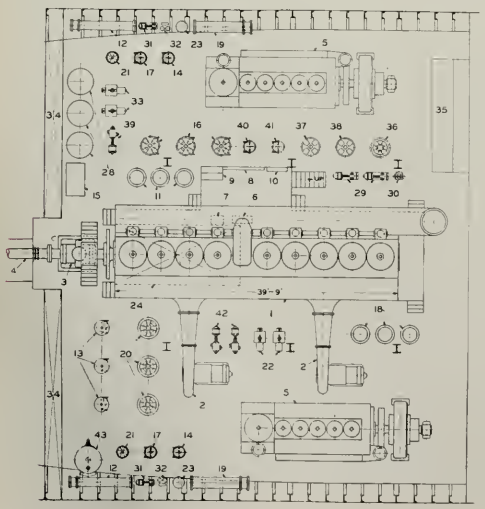


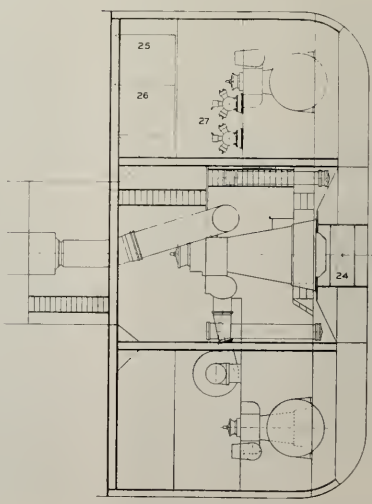
Control stand and gage board.

The diesel engine driven generating sets, which on this vessel are also of Nordberg manufacture, were operating with a total load of around 585 kw for all purposes. Approximately 350 kw is used by the two-motor driven scavenging blowers or 470 hp input. The amount of fuel burned

Machinery Arrangement of a Vessel Propelled by a 6000-shp Engine

Item	Description	No.
1	6000 S.H.P. Nordberg main Diesel engine	1
2	Centrifugal scavenging blower	2
3	Kingsbury thrust bearing	1
4	Propeller shaft	
5	800-KW Nordberg Diesel generator engines	2
6	Control stand	1
7	Engine telegraph	1
8	Gauge board	1
9	Log desk	1
10	Alarm panel	1
11	Fresh water coolers main engine	3
12	Fresh water coolers gen. engines	2
13	Fresh water circulating pumps main engine	3
14	Fresh water circulating pumps gen. engines	2
15	Fresh water sump tank	1
16	Salt water circulating pumps main engine	3
17	Salt water circulating pumps gen. engines	2
18	Lube oil cooler main engine	3
19	Lube oil coolers gen. engines	2
20	Lube oil pumps main engine	3
21	Lube oil pumps gen. engines	2
22	Lube oil centrifuges	2
23	Lube oil purifiers	2
24	Lube oil sump main engine	1
25	Lube oil storage tank	1
26	Lube oil settling tank	1
27	Starting air compressors	2
28	Starting air tanks	3
29	Fuel oil booster pump main engine	2
30	Fuel oil filter, main engine	1
31	Fuel oil booster gen. engines	2
32	Fuel oil strainer gen. engines	2
33	Fuel oil centrifuges	2
34	Fuel oil settling tank	2
35	Main switchboard	1
36	F.O. transfer and ballast pump	1
37	Fire pump	1
38	Fire and sanitary pump	1
39	Sanitary pump	1
40	Ballast pump	1
41	Bilge pump	1
42	Fresh water pumps	2
43	Evaporator	1







Switchboard of Emory Victory.

and chargeable to the motor-driven scavenging blowers was 204 lbs. per hr, which, added to the 2095 lbs. per hr charges to the main engine, gave an economy of .387 lbs. per shp. Including the power to drive all of the auxiliaries and accessories, lights, etc., the pounds of fuel per shp for all purposes was .408, which is a remarkably low over-all economy.

Reversing from operating 160 rpm, ahead to zero speed of the propeller, took 12 seconds. To go from 160 rpm ahead to 164 rpm astern took 54 seconds. The vessel was dead in the water in 3 minutes and 8 seconds. In the reverse order from 164 rpm astern to zero rpm took 9 seconds. From 164 rpm astern to 160 rpm ahead took 53 seconds. The ship also by that time was dead in the water. The combined exhaust temperature at full load was 540° F., at 110% load 610° F., and at 125% load 650° F. This is the temperature in the stack just before entering the waste heat boiler. The color of the exhaust was clear over the entire range. By observation the vessel was doing between 16 and 17 knots.

Army War Cargo Losses

The war against Japan cost the Army a total of 200,058 ship tons of cargo lost at sea—31 vessels sunk and two vessels damaged en route from the United States to the Pacific, Alaska and India theaters.

Army cargo shipped to these areas in the 44 months of the war totaled 43,520,000 ship tons. Those supplies lost at sea, therefore, represented only 0.46 per cent of the total amount shipped. This means that for each 10,000 ship tons of cargo sent from the United States to the Pacific, 46 were lost at sea.

Major General C. P. Cross, whose Transportation Corps has the responsibility for moving supplies to all overseas theaters, disclosed that despite the far greater sea distances in the Pacific, cargo losses there were less than half proportionately than those suffered in the Atlantic.

When losses in the Pacific are added to the previously announced 537,656 ship tons of cargo lost on outbound moves from the United States to the European, Mediterranean, Middle East, North and South Atlantic and Latin American areas, a total war loss of outbound Army cargo at sea of 737,714 ship tons is obtained.

Since the total Army cargo exports from December, 1941, through July, 1945, amount to 119,169,000 ship tons, the percentage loss for shipments to all overseas theaters is 0.62, or a loss rate of 62 out of each 10,000 ship tons exported.

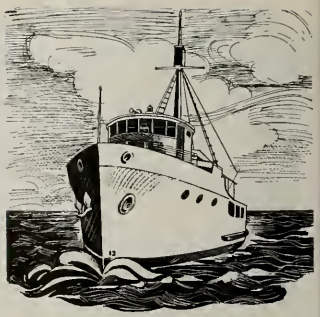
These totals include Army losses on vessels of American and foreign registry on outbound moves from this country. Information on Army cargo losses and statistics on cargo shipped on moves within and between overseas theaters is not available because of incomplete data.

Dutch Shipowners Urged to Expand

Urging shipowners to expand present steamship lines and inaugurate new ones, the Netherlands Ministry of Commerce and Trade predicts greater use of Holland's harbors by Dutch shipping in the future. Shipping which had used German North Sea ports before the war because of German Government subsidies will sail from Dutch harbors in increasing numbers, with special emphasis on Scandinavian trade, "Economic Information," the Ministry's publication, has declared.

However, some apprehension is felt in Netherlands' shipping circles regarding the curtailment of German industry, according to the publication. Since Holland has always been the "distribution office" of German imports, Germany's inability to import goods would have a serious effect on Netherlands shipping. The article expressed fear that Dutch transit trade, largely engaged in transport to and from Germany before the war, would suffer as a result of changes in German economic structure decided upon at the Potsdam conference.

Coast COMMERCIAL CRAFT



New Tuna Clipper Chicken of the Sea

THE NEW TUNA CLIPPER Chicken of the Sea, built by Birchfield Boiler Inc., Tacoma, for Captain Harold Morgan and his sons, recently completed sea trials and is now engaged in fishing for the Van Camp Sea Food Co., from whose brand of products she derives her name.

The vessel, which is of all-welded steel construction throughout and built to the American Bureau of Shipping Class E requirements, has an over-all length of 142 feet, between perpendiculars 137 feet, beam 30 feet and a depth of 17 feet 6 inches. Her draft midships is 14 feet, forward 13 feet, and after 15 feet, which permits a freeboard of 2 feet 6 inches with a load displacement of 1020.7 tons s.w.

Her hull and outboard profile presents quite a smart streamlined appearance, with her raked stem and overhanging stern. The main hull structure extends to the boat deck for almost three-quarters of her length from the stem, and for a considerable length amidships it continues on up to the bridge deck. This provides a very comfortable sheltered boat deck with large open ports for the quarters of the captain, engineer, radioman, and 16 crew members, which with adjacent washrooms are located in an all-welded steel deckhouse. Another steel deckhouse, placed in the midship area on the main deck, houses the combination galley and mess room, with the adjoining refrigerated vegetable and meat lockers and a conveniently located washroom. She has a mainmast and derrick at aft end of the bridge deck and her crow's nest is carried on a tripod on the top of the pilot house.



The main propulsion unit is a 4 cycle, 8 cylinder Buchi turbo-charged Enterprise DMQ 38 diesel engine developing 1560 hp at 300 rpm, which drives a single shaft and propeller. The main auxiliaries consist of twin 4 cycle D.S.X.-6 Enterprise diesels each of which develops 265 hp at 450 rpm, and drives 175-kw Westinghouse generators. There is also a 35-hp Caterpillar diesel engine used for stand-by purposes. The diesel fuel bunker supply amounts to 60,000 gallons, sufficient to permit the ship to cruise the entire Pacific fishing area, and is carried in double bottom tanks, midship side tanks, and a deep tank forward.

The bait and fish tanks are of welded steel built to conform to the lines of the vessel aft, and are equipped with discharge valves on port and starboard, so that the overflow may be discharged on either side of the vessel. This arrangement tends to keep the bloody water away from the side of the ship where the school of fish are.

The main refrigeration system is the all-brine type installed by the Northwest Baker Ice Machine Com-





Upper: Corner of mess room and galley.

Lower: Crew's quarters.



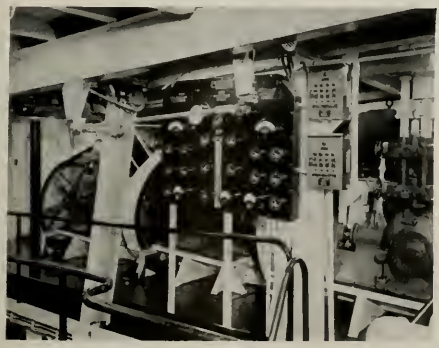


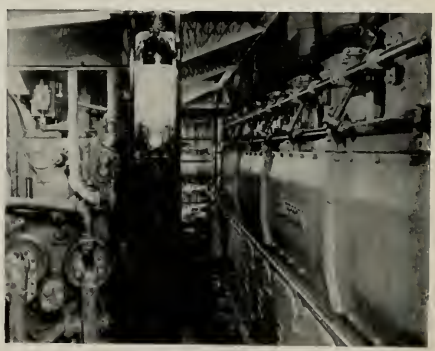
Upper: Intervox eye level of outside loop direction finder located over chart table.

Lower: The pilot house with wheel stand, automatic binnacle, Enterprise engine instruments and signals, and Webster-Brinkley photoelectric pilot.

pany, consisting of three main compressors, with 7½ x 7½ twin cylinder machines located on main deck alongside the machinery well. The ship's refrigerator is taken care of by 3½ x 3½ Baker twin set. General Electric motors power all ice machines and are compactly installed above the driven flywheels, between the compressors and the ship's side. Also on the main deck is an Ilg ventilation unit which delivers fresh air to all quarters and engine room. Seventeen 50-lb.-capacity carbon dioxide flasks on the deck, with outlets

Left: Instrument panel of Enterprise diesel engines with a Baker ice machine on extreme right. Right: View of engine room with 1560-hp main Enterprise diesel engine on right and one 275-hp Enterprise diesel auxiliary engine.





to all possible points of fire throughout the ship; provide ample fire protection. A general Electric automatic switch for operating the fire pump from the deck is another piece of fire-fighting equipment.

The pumping, lighting, ventilation and ship's refrigeration while in port are all handled by a 30-kw generator. The Caterpillar stand-by diesel has a twin disk front end take-off which can operate an auxiliary air compressor. A streamlined stack built into the after end of the pilot house contains the main engine exhaust, equipped with a Burgess exhauster. General Electric and U. S. Motors supply the power for the brine well circulation, and brine transfer pumps, which are Pacifics. The worm gear steering unit and electric anchor hoist are manufactured by the Johnson Foundry and Machine Co. of Los Angeles. The cargo boom and other hoisting is taken care of by a purse winch powered by a Westinghouse gear motor.

Radio Laboratory of Seattle supplied the radio equipment, which consists of a service and a stand-by radiophone and an RCA code radio. Immediately above the chart table there are eye levels and controls of an Intervox No. 65 outside loop direction finder. An intercommunication system between pilot house, engine room, galley, and main work centers is provided. Webster-Brinkley supplied the photo-electric pilot and Lionel Corporation the compensating binnacle, both located on the top deck. Submarine Signal Co. supplied and installed the 1000-fathom Fathometer.

The vessel was designed by Silas E. Nelsen and Hubert Bisson, naval architects for Al Davis' Birchfield Boiler Inc., to meet the requirements specified by the owner, Captain Morgan. Her cruising speed is 12.6 knots, and when in load condition 12 knots.

Newby Busy on Tuna Clippers

G. Bruce Newby, naval architect of Long Beach, is at present engaged on the construction and detail plans of a tuna clipper of his own design, whose dimensions are 105 feet O. A., 25 feet beam, and 12 feet in depth. The main propulsion unit will be an Atlas Imperial diesel engine of 540 hp supercharged. The builders will be the National Iron Works of San Diego.

Newby is also supervising the construction of two other tuna clippers, which are fitting out at the yard of Colberg Brothers of Stockton. These boats will be owned by the Westgate Seafood Products of San Diego, of which Wade Ambrose is president.

The main particulars of these vessels are as follows: one is 141 feet O. A., 29 feet beam, and 15 feet 3 inches depth, engined with a 600-hp Washington Iron Works supercharged diesel; the other is 112 feet long, 26 feet beam, and 14 feet 9 inches in depth, with a main propulsion diesel unit by Fairbanks, Morse of 540 hp.

The contract for these vessels was obtained by Clyde Wood, and the fitting out is being done by Colberg Brothers.

First Post-War-Built Towboat In N. Y. Harbor

The new 86-foot harbor tug Turecamo Boys is the first post-war-built towboat to make an appearance in New York Harbor.

The Turecamo Boys, owned by Turecamo Towing Company, was designed by Merrit Demerest of New York and built at Jakobson Shipbuilding Company, Oyster Bay, New York. The keel was laid March 15, 1945. This harbor tug is powered with an 8-cylinder 2-cycle gear drive General Motors diesel engine. The engine develops 800 brake horsepower.

George W. Codrington, vice president of General Motors and general manager of the Cleveland Diesel Engine Division of General Motors, says, "This lightweight, high speed engine was employed extensively during the war and is now being used in commercial installations. With this type engine we were able to furnish 200 more horsepower in 10 per cent less space and with 20 per cent less weight than with engines generally used heretofore in this size boat."

New Designs by Joslyn & Ryan

The firm of Joslyn and Ryan, naval architects and marine engineers, are at present engaged on the designs of 10 whale killer vessels for foreign owners. The proposed dimensions of these vessels are: 130 feet long, 27 feet 6 inches beam, 14 feet 1 inch depth, and a draft of 9 feet. The power unit will be a 1600-hp Uniflow engine and the speed will be about 17.5 statute miles.

The same owners have also requested that designs be drawn up for the construction of a whale factory ship, whose length may be between 500 and 600 feet.

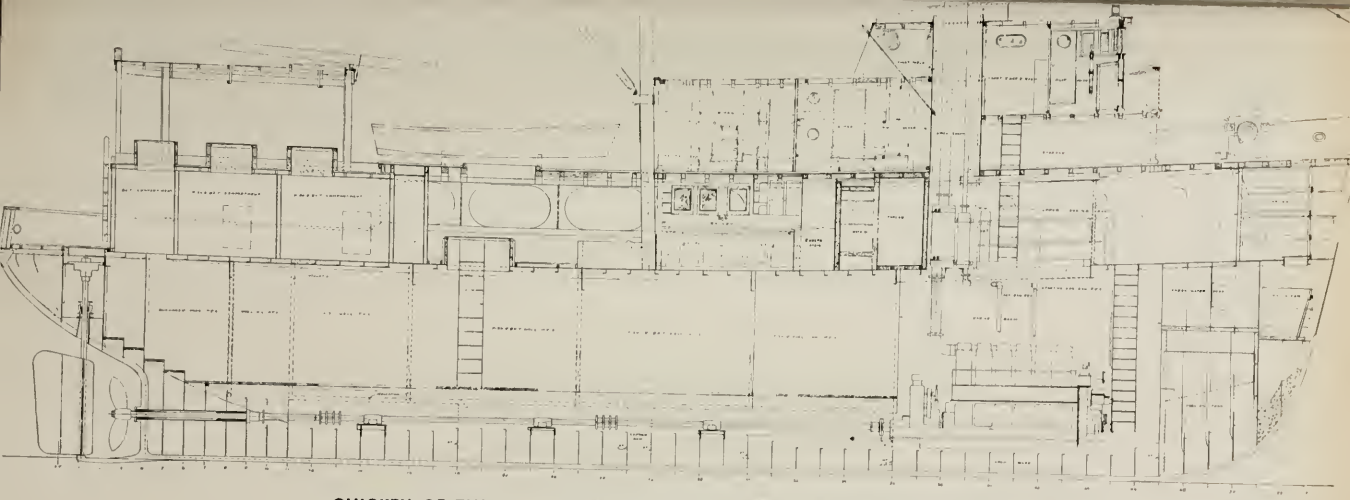
Princess Pat Completes Successful Maiden Voyage

The all-steel tuna clipper Princess Pat was the lead ship to return from the Galapagos fishing grounds to San Diego with the first fishing license issued since before the war and a full load of fish from these waters.

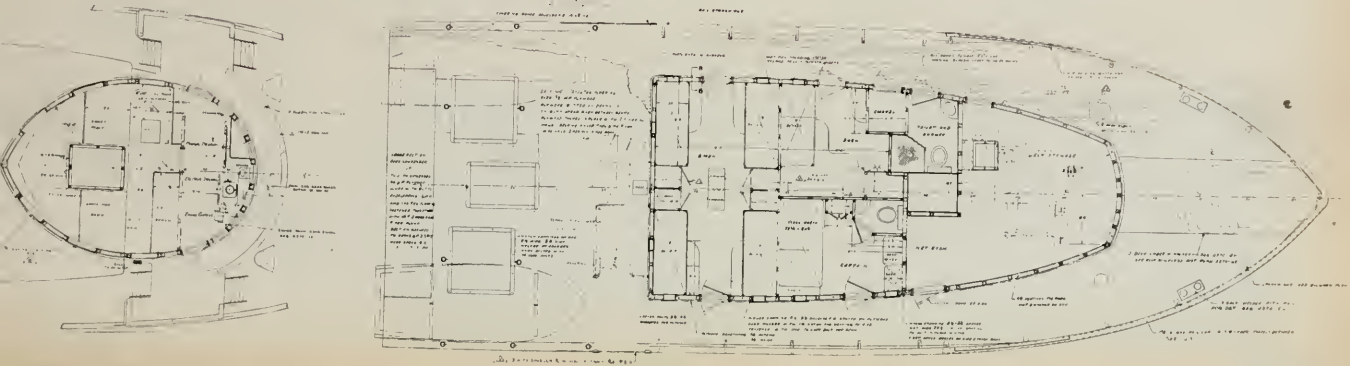
The managing owner, Otto C. Kiessig, reports that "the trip was uneventful, all the machinery functioning perfectly, and the performance of the ship and its power equipment was outstanding, requiring only corrections of a very minor nature."

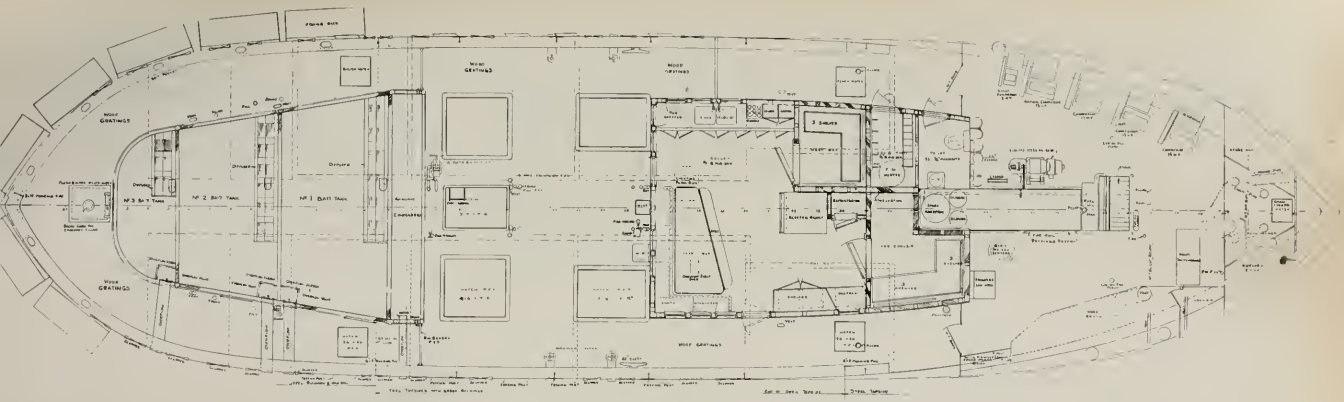
The Princess Pat was built and delivered by the Newport Beach Yard of the Consolidated Steel Corp. in July of this year and has a 99 feet O. A. length, a beam of 25 feet, and a depth of 13 feet 9 inches. She is powered by an Enterprise DMG 36 diesel engine of 600 bhp at 400 rpm, which gives her an average speed of 11.1 knots. The vessel was fully described in the September issue of this publication, and the general arrangement plans are as shown.

Arrangement plans of Princess Pat on following two pages.



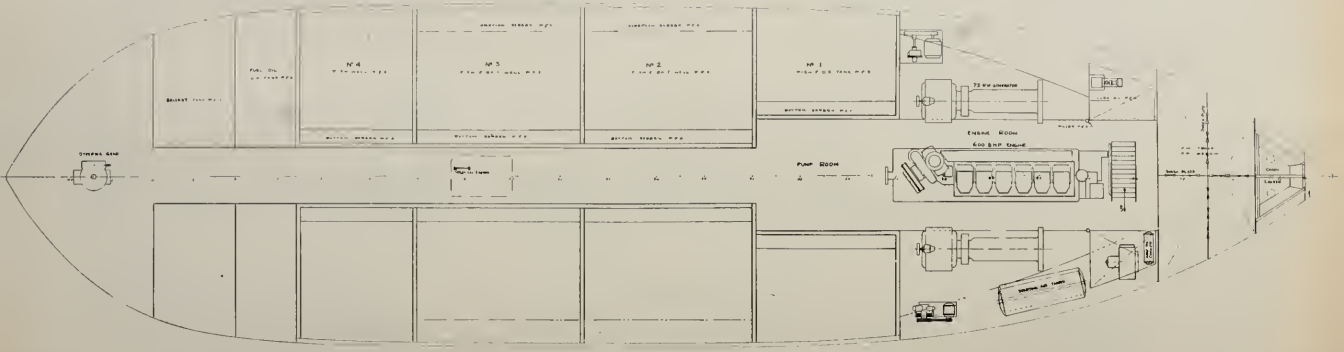
CHICKEN OF THE SEA—Above, Inboard Profile; Below, Bridge and Upper Deck Arrangement Plans.





PRINCESS PAT—Main Deck and Hold Plans.

Erratum—Plans on Page 719 are those of Princess Pat and not Chicken of the Sea as captioned.



Weighing Fish In Motion

New Method of Handling Sardines on Conveyor Scales

By Henry J. Barbour

Years ago, when a cannery's boats arrived with a cargo of fish the job of unloading and weighing them was not only a long and tedious one but was also thoroughly unsatisfactory to both the fishermen and the canneries. Now, thanks to modern machinery in the way of special pumps for relieving the vessels of their fares, and scales that weigh the fish while in motion, bottlenecks are broken and the job of canning rolls merrily along.

In the early days of the industry, the lampara boats and purse seiners tied up well offshore and discharged their cargoes into buckets which traveled along on aerial cables extending from the fish tower, at the tip of the cannery wharf, to moorings in the bay. The type of traveling bucket used carried about 615 pounds of the little fish, and the catch of each vessel was tallied and paid for in multiples of this unit of weight. The bucket method of offshore unloading served the industry from its beginning at the start of the present century until about 1927. This is the old method. It is out of date now, and but little used.

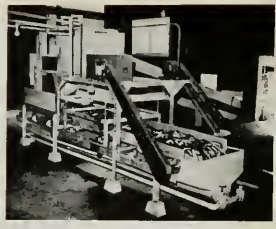
The trouble with the bucket hoist system was this. The lampara-rigged fishermen imported from the Mediterranean in 1906 had put the industry on its feet, but volume-minded American ingenuity was not content to stay with this Old World tradition when more sardines per boat and more dollars per man was the attractive alternative, and by 1927 a new type of purse seiner had evolved with a vastly greater capacity. Half a day was required to discharge the 100 tons which would constitute the average cargo of one of the seiners. The tedious 615-pounds-at-a-time method was too slow for the appetites of the growing canneries, and the situation was further complicated by the not infrequent heavy weather which would suspend operations completely for days at a time.

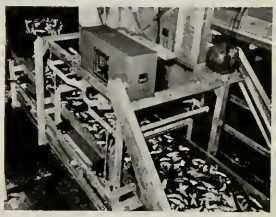
The answer to the unloading bottleneck was pumping the fish into the canneries through underwater pipes. A special design of Fairbanks-Morse centrifugal pump is used. At the deep-water end of the suction line a flexible hose is run up to the surface and there attached to the bottom of a V-shaped floating hopper. The seiners come alongside, spill their cargo into the hopper with whatever speed their mechanical unloading devices make possible, and the fish are sucked through the long tube and delivered undamaged to the cannery. An advantage quite unforeseen arose through the use of the pump discharge method. While less than one out of every 2000 fish is damaged by its journey through the suction pipe and the pump, the jostling and tossing of the trip is just sufficient to descale the delicate fish, and they arrive at the cutters with the first of the processing stages already accomplished.

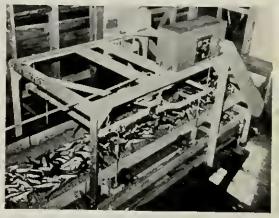
Unloading troubles were now ended. A single centrifugal pump, powered by a 30-horsepower motor, will bring ashore and de-scale about 70 tons of sardines in the space of a single hour—but a new difficulty presented itself. With the buckets no longer in use to tally the tonnage of the catch in 615-pound lots, it became necessary to weigh the fish by another means—and in such a manner as to slow their transit to a minimum.

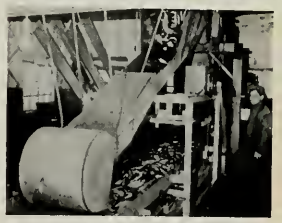
The first weighing methods adopted by the canneries involved the use of conventional suspended and weigh-can dial scales. The centrifugal pumps discharged the sardines into a flume which sluiced its load on to a wire belt conveyor, which in turn elevated them some 60 to 80 feet to the scale house. Here they were dumped into a hopper-type scale with two containers—each of about 500-pound capacity. Each unit was supervised by a weighmaster who controlled the stream of fish from the conveyor by means of a swing gate in the chute between elevator and scale. As the scale dial indicator would show that the first container had filled to approximately 500 pounds, the swing of a lever would divert the load of cascading sardines to the second can. The first could then be emptied and returned to its position on the scale. The latter operations could be performed in less time than that required for the filling of the other can.

Scores with the boat operators









Top: Most recently installed Fairbanks-Morse conveyor scale unit is at the Monterey, California, plant of the Edgewater Packing Company. Elevation on blocks permits the sardines to be flumed back under the scale and from there to storage tanks.

Second from Top: Sardine conveyor scale installed at Monterey, California, for the San Carlos Canning Company receives blue pilchards at approximately one hundred tons an hour. This is one of two units at San Carlos.

Second from Bottom: With three of the new Fairbanks-Morse sardine conveyor scales in present use, the K. Hayden Company rates highest among the Monterey, California, canners in weighing capacity.

Bottom: The Oxnard Canning Company uses two conveyor scales for weighing the pilchards.

were now tallied in terms of 500-pound can lots. The problem of unloading delay had been solved and the fish were being weighed, but the weighing system depended on human judgment and integrity for its accuracy, and as in any similar situation there were occasions when neitheir the canneries nor the fishermen were entirely satisfied with the method. An attempt was made at automatic weighing in bulk lots, but this involved boosting the unit quantity to 1000 pounds, and such a deluge of fish released simultaneously into the discharge flume had a habit of clogging and stopping operations.

At last has come the effective and complete solution of the problem—the Fairbanks-Morse conveyor scales—a weighing mechanism which will compute and record the weight of the sardines in transit as they pass over the scale on a conveyor belt moving at the rate of 100 feet a minute. The capacity of the scale as used in this application is 150 tons an hour, but to date the maximum discharge from the fish pumps to the conveyor belt has not exceeded an hourly 120 tons. The recorder registers the weight of the moving sardines to such an accurate degree that buyer and vendor are alike satisfied with the integrity and truth of the transaction record.

The scale unit is equipped with a fresh water sprinkler at each end of the conveyor run to wash the fish scale and broken particles and at the same time to neutralize the salt water which will inevitably drain from the sardines just removed from their natural element. Some of the installations employ belts made of stainless steel. Others use a belting of galvanized wire.

The capacity increase from the 70 tons an hour possible by the older handling process to the 150 tons an hour which the Fairbanks · Morse conveyor scale will pass (and the far more accurate and confidence-stimulating method of recording fish weight) is accompanied by another advantage. It was formerly necessary to station a weighmaster at each scale. Now a single operator can oversee the functioning of all of the conveyor scales in any one plant—a saving small per can of sardines but nevertheless of real proportions when figured at the volume to which the industry has grown.

The use of the Fairbanks-Morse conveyor scale in the fishing industry is growing rapidly, and canners are enthusiastic in its praise. The K. Hovden Food Products Company has installed three of them, and there are two each in operation at the Oxnard Canning Company and the San Carlos Canning Company. One Fairbanks-Morse conveyor scale apiece is working at the Central Packing Company, the Edgewater Packing Company, the Monterey Canning Company, the Monterey Fish Products Company and the San Xavier Fish Products Company.

The California Packing Company and the Carmel Canning Company have one each on hand—to be installed later this year when other items of necessary unloading equipment become available. Six more Fairbanks-Morse conveyor scales are building for delivery in the near future to other sardine processors in the district, and by 1946 it is anticipated that weighing fish in motion will be common practice among progressive canners.

Two San Diego Tuna Clippers

By K. M. Walker

The modern, all brine refrigerated tuna clipper Portiguesa was built by the Lynch Shipbuilding Company at San Diego for the Manuel Rosa family. This fine wooden vessel is 122 feet long over-all, 27 feet beam and 13 feet 6 inches molded depth, and will carry approximately 200 tons of tuna in brine. The big clipper is managed by Victor Rosa and will fish for the Van Camp Sea Food Company.

Main propelling power is supplied by an 8-cylinder 12″ x 15″ Enterprise diesel engine supercharged to 800 horsepower. This power is delivered at 375 rpm and turns a 3-blade bronze propeller 72″ diameter and 42″ pitch to give the vessel a speed of 10 miles an hour.

Auxiliary power is furnished by two 112-hp Caterpillar diesel engines each driving a 110-volt, 75-kw direct current generator. All pumps and compressors are individual motor driven. Refrigeration is furnished by two 5″ x 5″ Kohlenberger compressors each with 20-hp motors and one 6″ x 6″ Kohlenberger ammonia compressor driven by a 30-hp motor. Brine is circulated by 14 one-hp motors each driving a 2½″ centrifugal pump and all are neatly arranged along the shaft alley bulkhead, seven on a side.

Bait pumps are two 10″ centrifugal pumps driven by 15-hp motors and one 8″ centrifugal pump with a 10-hp motor.

Starting air is supplied by two Worthington 2-stage compressors each driven by a 5-hp motor.

Fuel is carried in four of the brine holds on the southbound voyage, two steel tanks on each side at the forward end of the hold being arranged for fuel oil and brine. With the large bow tank and two steel tanks in the stern, a total of 31,000 gallons of fuel oil can be carried. The two stern fuel oil tanks are also arranged to stow fish in brine. The two forward bait tank compartments on deck are fitted with brine refrigeration, while the third, or after bait tank, is arranged only for bait and fuel oil and will be empty on the northbound voyage. On a basis of estimated fuel consumption of 40 gallons per hour the ship will have a range of 7750 miles.

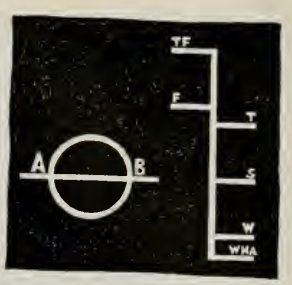
There is an electric windlass forward driven by a 10-hp motor and a 2-ton cargo winch on the upper deck aft driven by a 5-hp motor. The steering gear is electric motor driven

The crew accommodations consist of 15 berths, all located on the upper deck in light, airy rooms. The galley and messroom is located on the main deck in the after end of the house, where cooking is done on an "Ingle" fuel oil range with Monel metal hood and trim. This is an unusually commodious room extending the full width of the house, with sink and dressing table the full length on the starboard side and crew's mess table and seats down the port side.

Manuel Rosa, who superintended the construction from the keel laying to completion, has given all possible consideration to the comfort and convenience of the crew, and

(Continued on page 765)

LOADLINES RESTORED



By Lt. Case Davison, USMS

After several years of disregard because of wartime emergency needs, observance of loadlines is again being enforced.

Administration of the International Loadline Laws now and henceforth is being accomplished at each American seaport by the Merchant Marine Inspection Service of the United States Coast Guard; prior to the war enforcement of loadlines was handled through the customs offices.

Assignment of requisite loadlines and certificates remains unchanged, those duties being the care of the American Bureau of Shipping.

Masters of merchant ships are reminded by the Coast Guard that loadline certificates must be endorsed annually, regardless of the expiration date of such certificates.

Coast Guard officers and men of the Inspection Service will check each vessel's loadline and draft immediately before sailing and issue the documents necessary for obtaining clearance.

Loadline markings—of a sort—were first originated and used by the famous merchant traders of the Mediterranean many centuries ago. The beginnings of such marks were in the nature of trade-marks to indicate vessel ownership by the mercantile houses that dominated waterborne commerce.

Various types and kinds of symbols were thus employed, one of the most common being numerous variations of the loadline disk we know so familiarly nowadays. (The important zone and season marks used currently were, of course, not yet developed.)

It appears from historical records that the Phoenicians, Egyptians, Greeks, Romans, Sardinians and some of the Slavic peoples commonly used such marks approximately a thousand years before Christ. It must be borne in mind, however, that their "trade-marks" were just that—and had no relationship with the loadline markings of today that are primarily for the safety of ship, crew and cargo.

Evolution through the centuries disclosed that an unfortunate number of merchants were inspired by greed to dangerously overload their vessels without any regard for the seaworthiness of the ship that was thus deeply laden. Thousands of ships were lost at sea as the years passed. Seamen were cheap—and the merchants charged off to experience the ships and goods thus lost. Those losses were "normal" business risks, and the additional profits of deep-laden ships offset the occasional financial disaster because of what was considered simply as bad luck in a commercial venture.

About 500 years ago, marine insurance in its modern form came into being. Merchants protected their shipping interests against possible complete losses by investing in each other's voyages. Thus, a merchant sending a vessel off on a voyage would pay relatively small sums (our modern "premiums") to other merchants against the chance the deep-laden ship would be lost, and if it were, he could then recover a major portion of the far greater financial loss he otherwise would have borne alone. Since most ships did actually complete successful voyages, despite the fact they were loaded to a risky point of unseaworthiness, such maneuvers were good investments for all concerned just by virtue of the law of averages.

But as the business of marine insuring became better developed and more specialized, it wasn't long before the underwriters of ships and cargoes felt a desperate need for a more systematized and standardized yardstick for loading ships and a generally better arrangement for protecting the money they were investing in insurance. They wanted a more exact measure for the risk of their money. A limit to the amount of cargo that any given ship should put to sea with they felt, would be a big step in the right direction, along with other factors for consideration.

Meanwhile, the forerunner of present-day loadline marks—the ancient trade-mark symbols—continued in common use as a matter of convenience and tradition, the origins of which had already been almost forgotten.

In the Middle Ages the merchants were placing their trade-marks on the ship's hull to indicate the great depth to which they could load each vessel; contrary to present use, such "loadline marks" were in the nature of a boast, rather than a care for safety.

Incidentally by that time most of the ships of the mercantile houses of Venice were marked with a cross, those of Genoa commonly used three parallel bars and ships of Sardinia seem to have created and used the circle-and-line symbol that alone has remained until today as the loadline disk of all modern maritime nations. The circle has no use of value nowadays except as a familiar reminder of the great antiquity of the seafaring profession and the many customs and traditions with which it is so richly endowed.







U. S.

THE UNITED STATES NAVY has a tremendous investment in plants and facilities for the building, repair and maintenance of ships on the Pacific Coast. It is the intention of the Navy Department to continue the operation of its West Coast Naval Repair Bases without interruption in the big job of keeping up the peacetime Navy.

Most recent of these establishments is the Los Angeles Harbor plant, known as U. S. Naval Drydocks Terminal Island, California. Of this $65,000,000 plant Rear Admiral Cochrane, U.S.N., Chief of the Bureau of Ships, said, "The United States Naval Drydocks on Terminal Island will be a permanent peacetime establishment furnishing drydock and repair service to a large part of the fleet which will return to base in this harbor."

Work on the Terminal Island area, now occupied by this base, was started in September, 1940, under a contract let by the Navy to Guy F. Atkinson Company and George Pollock Company, the intention then being to build some shops, three drydocks and some outfitting piers, and lease the facility to the Bethlehem Steel Company Shipbuilding Division, for operation with naval priority. In February, 1943, the Navy took over the facilities for operation and selected Captain Fred M. Earle, then Production Officer at Bremerton Navy Yard, as the first commanding officer of U. S. Naval Drydocks Terminal Island.

Top of page: Three cruisers, a destroyer and a converted four-stacker tie up at one of the outfitting piers.

Center: Twelve ships in one huge drydock.

Bottom: Caisson is closed by tug as huge warship is drydocked.

NAVAL DRYDOCKS
TERMINAL ISLAND

(All Photos Official U. S. Navy Photos)

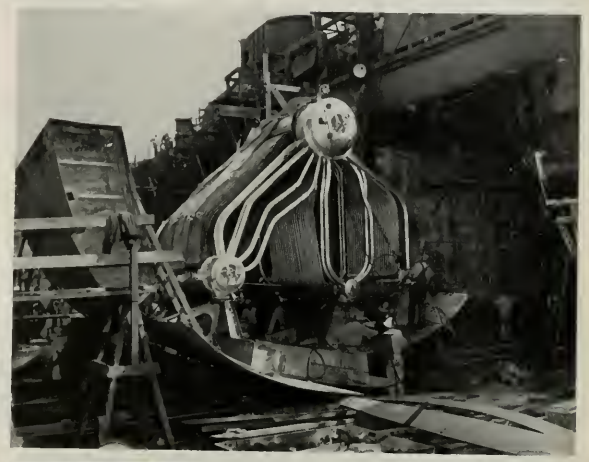
When Captain Earle took over on February 25, 1943, the following facilities were installed: a small wing of the Administration Building; a small combination Personnel and Guard House Building; a large machine shop — sans machinery; two warehouse-type structures; a Public Works shop and garage and small utility building; three drydocks, the large Morcell Drydock being the only one of the three completed and in operation; and the 1000-foot pier Number One.

The Morcell graving dock is over 1100 feet long, one of the largest in the world, and will accommodate any ship afloat. Today there are completed and in operation the other two graving docks, known as cruiser docks, each 700 feet long, and moorings for two floating drydocks off the end of pier four.

There are four concrete piers each over 1200 feet long completed or under construction, and these are served by six 25-ton and two 50-ton portal cranes.

These docks are equipped with the most modern of caisson gates and with very powerful electric drive pumps controlled from the dock house, so that once a ship's hull is spotted it is only a very short time before the dock is empty and the ship's hull sitting on the keel and bilge blocks ready for scraping or for hull repairs.

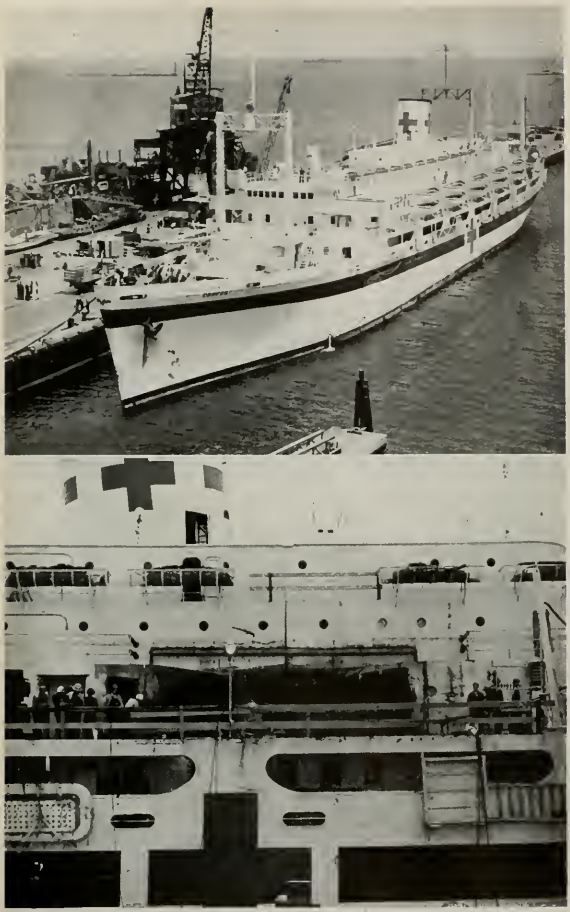
The machine shop, one of the largest in the West, is now completely equipped with all types and varieties of the highly specialized machine tools necessary in this type of establishment. Included in this equipment are several tools that are the largest of their type on the Pacific Coast. Instances are: the largest boring mill west of Chicago; and the 630-ton machine planer used for facing armor plate. This latter machine, notwithstanding its immense size, is so delicately adjusted to accurate machining that it has to be protected





Upper: Unique prefabrication repair job in last stages of completion on U.S.S. Jenkins. Huge hull section and boiler ready to be launched by means of temporary greased way into side of the ship.

Lower: Hull section with installed boiler on its way into place in the side of the ship.



Upper: Berthed at U. S. Naval Drydocks on Terminal Island for repairs as the result of a Japanese tarpeda bomber's "suicide attack," the Navy hospital ship USS Comfort bears mute testimony to the savageness of our foe in the Pacific. The Jap plane crashed into the fully-lighted, clearly identified hospital vessel while it was attempting to evacuate wounded men from Okinawa, killing 31 and wounding over 50 more. Lower: The gaping hole in the superstructure and main deck of the ship.

by a special housing in which air conditioning is used to maintain a constant temperature. At the present time a $1,700,000 addition to this shop is under way.

The bays of this shop are served by powerful electric bridge cranes of combined capacity to meet any weight-lifting demand that could arise in operation of machine tools. All the principal tools are of individual electric drive and the small tools are driven in groups. Electric power wiring is all installed in conduit, laid in troughs in the concrete floor. Special control dead front switchboards divide the power circuits into convenient grouping units.

Fenestration is amply provided, and a well-designed system of indirect lighting takes care of night work and dark days. In design and equipment this machine shop ranks with the best in the country.

Plate Shop

The plate or steel shop is the heart of a shipyard so far as ship hull work is concerned. Here at Naval Drydocks the plate shop and the plate yard adjoining are both under cover and each is served by an electric bridge crane with a 100-foot span. The plate shop is equipped with bending rolls, bending press, multiple drill presses, punches, shears, bulldozers, furnaces, and a modern 1000-ton hydraulic forging press that operates under finger-tip control.

Complete equipment for electric arc welding and for flame cutting is installed, including several flame cutting machines for duplicating.

Electrical and Optical Shop

This is one of the most interesting buildings in the yard. Heavily constructed of reinforced concrete, it is erected on a floating foundation to prevent vibrations from disturbing delicate instruments. The building, which cost over $700,000, contains 100,000 s.f. of floor space. The largest electroplating shop in the West is housed in this shop. Here radar, range finders, sextants, all types of electric controls, ships' radios, compasses, and many other gadgets are adjusted, repaired, tested, and returned to the ship as good as new.

Woodworking Shop

A large building of two stories which houses the riggers' shop, joiner shop, sail loft, and mold loft. In the riggers' department, cables and manila gear are manufactured or overhauled and reinstalled. The joiner

shop manufactures all types of ship furniture and fittings as well as small boats of many types.

All canvas items such as sails, tarpaulins and gun covers are cut to measure and fabricated in the sail loft.

Expert loftsmen lift the accurate measure of ships' forms and in the mold loft make templates of plywood paper to guide the shipfitters in shaping and dimensioning steel in the plate shop.

There are many other miscellaneous shops, such as piping shop, coppersmith, blacksmith, electric wiring, salvage shop—in short, U. S. Naval Drydocks at Terminal Island is a complete plant ready to tackle any major repair, reconditioning, or conversion job for any type of ship.

As of August, 1945, the record shows:

Total dockings	406
Total availabilities	685
Total major repairs and overhauls (over 1000 man-days)	303

Major ships handled:

Battleships	9
Cruisers (CA & CL)	14
Carriers (CVE)	14
Destroyers	46
Destroyer Escorts	21
Oilers (Home Port)	39

Major Conversions:

USS Hope, Navy Hospital Ship

USS Arcadia, Destroyer Tender

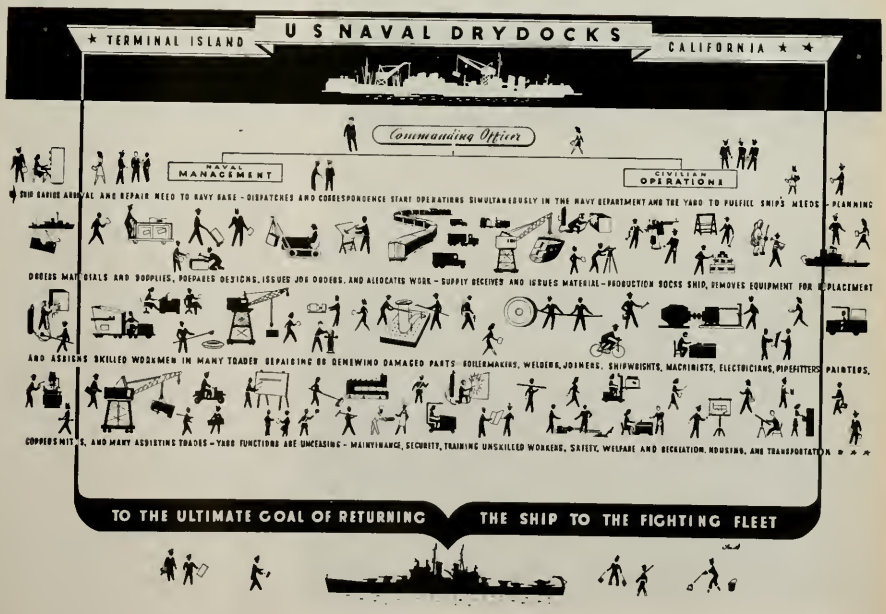
Warehouses

Stored in reinforced concrete warehouses is a stock of industrial stores representing 87,000 different items for the repair and maintenance of the fleet. This stock is valued at $27,000,000. Monthly issues, exclusive of ordnance material, total over $1,000,000. The cafeteria, with its annex and 12 portable units, serves nearly 14,000 meals daily. The annual civilian pay-roll averages over $38,000,000. When present construction is completed the total U. S. Navy investment on this plant will be approximately $65,000,000 in property and buildings exclusive of equipment.



Captain George T. Paine, U.S.N., assumed duties of Commanding Officer of U. S. Naval Drydocks, Terminal Island, and Industrial Manager of the Eleventh Naval District on August 20, 1945.

In August, 1945, Captain Earle was detached from U. S. Naval Drydocks to be succeeded by Captain George T. Paine from the Boston Navy Yard.





Orinoco, now Puebla, on a previous visit to the Bethlehem yard.

Rebuilding of a Troopship's Diesel Engines

AT BETHLEHEM STEEL COMPANY

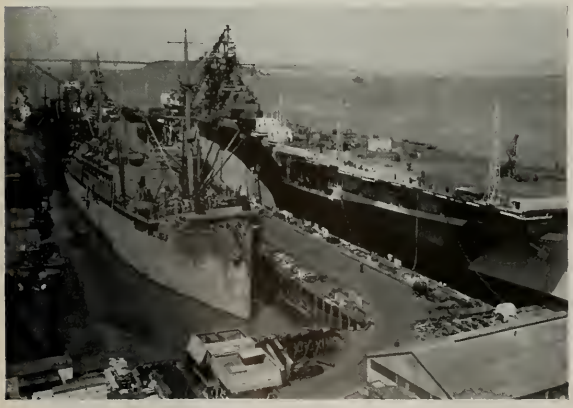
By George H. Harlan

IN 1942 THE UNITED STATES Government leased from the Republic of Mexico a German passenger ship, stranded in a Mexican port and there interned by the Mexicans. This 9600-ton Hamburg-American liner Orinoco had been in passenger service between Germany and the South American ports prior to World War II, and, when obtained by the Americans was turned over to the U. S. Army and converted into a troop transport at New Orleans Port of Embarkation and rechristened Puebla.



Above: The Puebla. (Official U. S. Signal Corps Photo.)

Below: The ship in dydock.



After having been assigned to duty in the South Pacific, to be operated from the San Francisco Port of Embarkation, the vessel was sent to the Pacific Coast, given ordinary trip repairs, and then placed in regular service. But the diesel driven, twin-screw liner did not stand up under the beating she received in trans-pacific voyages. Her Bremer-Vulkan single acting, two cycle engines, which combined delivered better than 8000 ihp, soon developed trouble which called for extensive overhauling at the conclusion of each round-trip crossing. Such overhauls proved to be not only alarming in their frequency, but also in that all parts were designed to metric measurements, and thus each replacement had to be manufactured as it could not be purchased on the open market.

Time came to make a decision as to whether the vessel should be taken out of service at a time when troopships were badly needed (and, as a troop carrier, the Puebla was one of the best), or whether she should be entirely rebuilt mechanically. The latter decision meant that the ship would be out of service for a long period of time, and it was reached with the hope that she could be operated again before the urgency of need in Pacific waters abated.

Bethlehem Steel Co., Union Yard, San Francisco, undertook the task of rebuilding the Puebla's engines. The work was accomplished throughout the better part of the year 1944. The

Puebla was not new to Bethlehem Steel. When she first came to the Pacific Coast the ship was sent to Bethlehem to have new diesel engines placed in her generating sets. She had four diesel generators of about 300 kw each, driven by M.A.N prime movers. These worn-out models were replaced with four Enterprise four stroke cycle units, two of them supercharged 450-hp machines and the other two atmospheric induction 360-hp engines. The arrangement of the ship's engine room precluded any possibility of the old sets being removed from the ship without burning out the plating and the frames of the ship's side in their way and removing the engines while the vessel was in drydock. So the "appendectomy" was performed and the new engines were set in place before the sides of the ship were welded back into place again.

Overhauling and rebuilding the main engines was not so readily accomplished. The big diesels had to be stripped down to their bed plates, and the job of realigning, reassembling, and remachining was begun. One of the problems involved was to "Americanize" the engines, that is, to make their component parts come up to American standards of measurement. The rebuilt engines were about 95% standard dimensions when completed. The engine beds were raised, reinforced, hand finished and then realigned. This was accomplished with the use of about 700 steel chocks which were placed under the engine bed-plates. All hold-down bolts were renewed, and about every other hold-down bolt fitted. To prevent shearing of the hold-down bolts, fitted collision chocks were placed to take the fore and aft thrust and thwartship motion. The main bearings were "Koleen" cleaned, remetaled and remachined. Federal Mogul diesel babbitt was cast into the bearings by centrifugal means. The babbitt was designed not to chrystallize or fracture and yet maintain the hardness required for diesel operation.

The crankshafts of both engines were removed and remachined. Both the journals and crankpins of these shafts were given a new standard diameter of 18 inches. Each crankshaft is in two sections, and each section incorporates four of the eight cranks to each main engine. Each shaft weighs approximately 80,000 lbs. and is a little over 50 feet in length.

The columns supporting the cylinder blocks were set up and lined up prior to the installation of the blocks themselves. This realigning was accomplished by refacing the feet and tops of the columns, a task requiring more than five weeks to accomplish, and perhaps one of the most tedious jobs of the entire assembly. After the columns were erected, the cylinder blocks themselves were installed. There are eight cylinders to each main engine, and of the eight, six cylinder blocks per engine were re-

Upper: Crankshaft being prepared for a safe lift onto Puebla from the flat car.
Bottom: Crankshaft being lifted from flat car.





Crankshaft being lowered into the hatch.

newed. There are a total of nine cylinder blocks to each engine, the center block being a part of the original air injection system which was discarded by the Germans. The cylinder blocks of both main engines received new liners, bored out to standard American dimensions.

All of the crank pin bearings were renewed, the connecting rods were resurfaced, and a new bore for crosshead pins was established at 14 inches. The crosshead bearings were remetaled, as were the crosshead slippers, which were also remachined on the faces and on the sides. The pistons and piston skirts were reconditioned to conform with the new bore of the cylinders, and the piston rods were also turned to American dimensions. The piston heads, which are composed of an inner and outer head with a cooling space between, were either reconditioned or renewed as found necessary.

One of the chief difficulties of the Puebla's main engines in all of her voyages under the American flag prior to this overhaul was that encountered in the fuel injection system. At first she had air injection (air blast) of the fuel oil into the cylinders, but her German owners discarded this system in favor of solid injection and adopted the Archaouloff system. The enormous air injection piston required approximately one quarter of the delivered horsepower of each engine for its operation. The Archaouloff system requires only a small fraction of this power, and, in brief, this system consists of a separate Archaouloff pump and injection valve for each cylinder. The Archaouloff pump is actuated by the compression of air in the main engine cylinder on the upward stroke. This compression operates a four-inch gas piston which in turn transmits the compression pressures to a one-inch fuel plunger above the gas piston. From the fuel plunger, the oil goes to the injection valve and then to the combustion chamber of the main cylinder. On the fuel end, pressures up to 4500 lbs. per sq. in. are obtained, and originally the plungers themselves and the plunger



Machining the main engine bearings while in position with a machine designed especially for the job.

barrels were made of different metals to prevent freezing due to close clearances. But the cast iron used in making the plunger barrels cracked under the extreme pressure, and, despite close clearances in the assembly, both plunger and barrel were made of 52100 S. A. E. steel, which has proved very satisfactory in long periods of service. In order to prevent the sticking of the gas piston, a common ailment of Archaouloff pumps, a new method in their construction was introduced which consisted of hard-chrome plating the gas cylinder bore. This plate was then ground in a precision grinder to standard dimensions. No further sticking of the gas pistons was encountered in many thousands of miles of service.

In order to accomplish proper injection, three separate filters were installed in the fuel oil lines to the main engine injection valves, the last filters being attached to the discharge side of the Archaouloff pump. These filters are of the metal edge type. The filtering arrested the flow of even the most minute particles which would clog or damage the fuel injection valves.

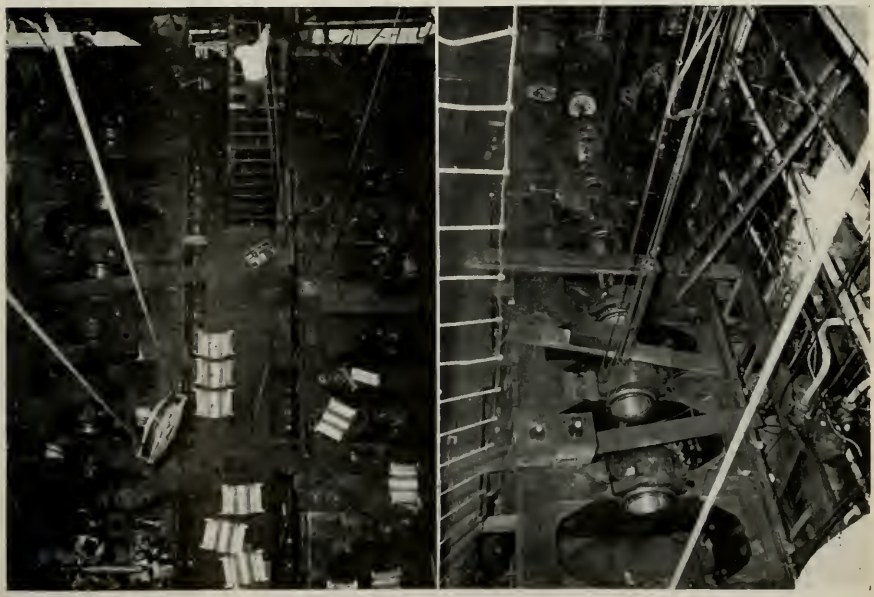
All high pressure fuel oil lines and lubricating oil lines were either reconditioned or renewed, and this involved over a mile of piping. The circulating water lines were reconditioned, as were all the crosshead telescope carriers and telescope pipes and packing in connection with piston cooling. The piston cooling still remained a water system. However, a new lubricating oil system was installed in each piston, which consisted of a Manzell lubricating unit with eight independent lines going to the cylinder liners at eight different places, 45° apart. The oil was fed into the piston chamber through check valves, entrance of the oil into it taking place during the scavenging phase of the stroke.

During his years of association with marine diesel engines, M. T. J. Garlinger, Assistant Superintending Engineer of the U. S. Army at Fort Mason, has been an advocate of preheating large diesels prior to starting so that sudden temperature changes in the unit and all their attendant ills will not be present to be troublesome. A source of steam supply was brought from the donkey boiler through a heat exchanger to the engine block, heating it through means of the fresh water internal cooling system. In eight hours the engine block can be brought up to 150° F. from normal cold engine room temperatures. In that length of time, and from the temperature rise, the giant engines increase approximately ⅜" in length. At this new temperature the engines readily start on 450 lbs. of air.

To complete the installation, all auxiliaries were thoroughly overhauled, including three huge electrical scavenging blowers which deliver 27,000 cubic meters of air per hour at 3200 rpm. Ever since the engines have been rebuilt they have performed efficiently and dependably, and have done their part to haul troops to the front in the last pushes of the war, and now propel a ship which speeds our veterans home.

Looking down into engine room; bearing at lower left being machined.

Looking down into engine room; bearing in upper center being machined.



Paint

With the return of a thousand ships to company colors, the painting problem is back with both operators and builders. Two articles in this issue relate to the selecting and testing of paint. Additional articles will be published from time to time.

As with so many other phases of the maritime industry, foreign trade is linked with paint. The basic oils in paint are largely imported, and there is an up-to-the-minute outline of conditions in the linseed and other oil industries on page 753 of this issue.

Marine Paints

By Harold R. Harlan

The tremendous technical advances resulting from the war activities in numerous fields have introduced many new and novel materials and techniques to the tradition-bound and conservative marine trade, particularly shipbuilders. While naval architects are at present studying the effects of sunlight, salt water and continuous vibration on such materials as the newer light alloys and laminated timbers, they cautiously admit the probability of considerable usage and value of such other substances as laminates of glass cloth or cellulose fibers, low-grade wood and many other materials. Small boats with molded plywood or sisal hulls have already made limited appearances.

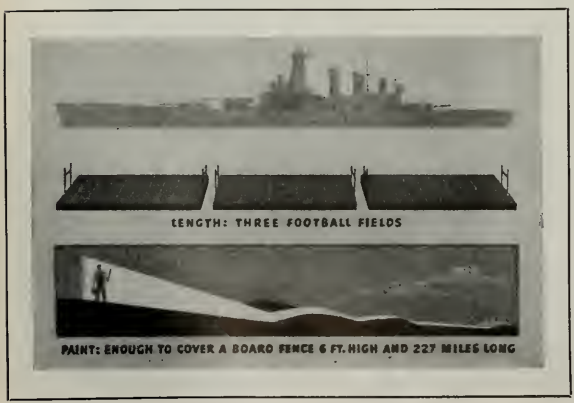
The introduction of such materials into marine construction necessitates the revision, and in some cases the abandonment, of present painting materials. Orthodox marine paints fail decidely on light alloys when exposed to sea water; under these conditions the paint films deteriorate rapidly and in a relatively short time develop electrolytic couples between the metal pigment and the alloy, leading to the destruction of the alloy. To avoid this, it is necessary to provide the light metal alloy with a primer that is absolutely water-impermeable and of high insulative value. Wherever dissimilar metals are used in ship construction, a similar coating should be used to provide an insulating and protective layer between the different metals. For such purposes orthodox paints leave much to be desired, and develop other deficiencies, such as embrittlement and loss of adhesion.

Adhesion of paint materials to laminates presents another adhesion problem due to the impervious surfaces involved; failures by conventional coatings are usually characterized by cracking and eventual peeling of the coating. Tests, using high-density-type primers with relatively short high phenolic resin-alkyd vehicles, appear most promising, although applicational difficulties remain to be corrected.

One of the most fruitful fields for advancement in marine painting involves the surfaces of the vessel below the waterline. Conventional antifouling paints depend upon compounds of heavy metals for the restriction of fouling on hulls. Here again corrosion in the form of accelerated attack on metals coated with such heavy-metal antifouling paints at any point where the electro-positive metals in the paint (such as copper and mercury) come into chemical contact with the less electro-positive metal of the hull. Such attacks are localized at holidays or where deficient undercoating occurs; while pitting of the hull metal frequently results, more serious damage can occur and larger corroded areas develop, as the copper is frequently deposited at such contacts, leading to the establishment of secondary couples and considerably accelerated corrosion. Wherever this occurs fouling results, as the antifouling qualities of the paint depend upon the amount of soluble copper at the sea water-antifouling interface, and the deposition of copper as metal reduces the available soluble copper in the immediately adjacent areas.

While copper and mercury compounds have always been the backbone of toxicants used in antifouling and copper bottom paints, proper balance of these materials to each other and to the other ingredients in the paint is essential. It may be noted

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that the copper-mercury content of such paints has been considerably diminished in recent years, without reducing the effective antifouling qualities. In many cases an actual increase in fouling deterrency has been developed. In fact, no correlation between copper-mercury content and antifouling efficiency can be determined by chemical analyses, as shown by analyses and fouling tests reported by the California State Department of Agriculture.

These improvements in effective fouling prevention have resulted from the balancing of the heavy-metal concentration with non-toxic inerts and the pigment-vehicle ratio to produce a coating the permeability of which is sufficiently high to minimize or, in some cases, eliminate impedance to the diffusional process whereby the soluble toxics are brought to the paint-water interface at a concentration sufficient to prevent fouling.

As these results have been achieved by various manufacturers only through extensive and frequently discouraging exposure tests, the actual basis of the successful formulation is often not immediately recognized and the success of the new formulation attributed to some new ingredient, or process, resulting in extreme secretiveness as to the process and ingredients involved or exorbitant claims for some ingenious treatment which accelerates the activity of the toxic metals. These claims are often made in good faith. The meager patent literature on antifouling paints abounds with references to the effectiveness of various materials, however, and actual tests never substantiate the claims.

While copper and mercury and their salts still appear the most effective toxics for antifouling paints, this may not always hold true; it is not impossible that future antifoulings may contain neither ingredient. With better understanding of the principles involved in the prevention of underwater growth, and the multitude of new raw materials made available under the pressure of the recent crisis in our national life, such an event does not seem improbable. The insecticide known as DDT has already found favor in antifouling paints; while it is incompletely tested so far, present data indicate a high degree of effectiveness toward the prevention of certain types of shell growths but no effectiveness in other directions. Thus DDT may be the first of a long line of new substances, not necessarily related, which may function in antifouling paints to their better performance and extended effective toxic life.

Peacetime Colorings

Acting on a Navy Department directive removing the war requirement that merchant vessels be painted grey on exterior surfaces, the WSA has notified its General Agents that time chartered vessels, including troopships, may return to peacetime coloring and stack markings of the various operating companies. All troopships owned by or under bareboat charter to the WSA are to continue grey coloring as long as they are engaged or may be required for the transportation of troops. They may, however, display stack markings.

All WSA-owned vessels of the long-range construction program types and Victory ships, if not converted for carrying troops, will take on peacetime colors in accordance with a uniform standard color scheme. Liberty ships, N-3s, C1-M-AV1s and all other vessels will be painted as directed by the WSA. All WSA-owned tankers will, for the present, retain their grey paint.

The regulations prescribe the following color scheme for all cargo vessels owned by the WSA:

Hull—black from load waterline, red boot tapping between light and load water lines.

Hull (reefer ships)—light grey.

Deck Houses—white.

Exterior Deck Heads—light green.

Bulwarks—buff.

Hatch Coamings—buff (tankers—grey).

Masts, Booms, King Posts, Flagstaffs, Davits and Winch Resistor Houses—buff (Section of Mainmast—black in way of smoke stack)

Ventilators—buff (fireroom—black).

Interior of Cowls—vermilion.

Boat and Superstructure Decks—red.

Main Decks—red or oiled.

Chocks and Bitts—black.

Pipe and Chain Rails—buff.

Deck Machinery—grey.

Lifeboats—exterior white; interior grey.

Smokestack—company colors, optional.

Standing Rigging—white lead and tallow.

Ship's name on bows and stern—chrome yellow.

All wood calked decks—unpainted.

"No Smoking" signs in six-inch letters to be stenciled on main deck bulkheads, boom tables, and on deck houses appropriately; also on the inboard side of hatch coamings.

Wood Doors, Ladders and Rails—varnished, optional.

All exterior paints to be semi-gloss.

If you tell the average man there are 270,678,934 stars in the universe, he will believe you, but if a sign says "Fresh Paint," he has to make a personal investigation.

Advice from a CPO to rookie seaman:

"When you aren't sure what to do, follow these general rules:

"If it moves, salute it.

"If it doesn't move, pick it up.

"If it is too large to pick up, paint it."—California Engineer.

Choice of Organic Finishes

By P. W. Prouty

SELECTION OF A suitable protective or decorative coating depends upon many variables, so while no definite plan or set of rules can be universally adopted, some considerations are basic and can be applied to all jobs. There are about several hundred more materials which can be used for good finishes than were available at the end of the last war. However, neither the paint manufacturer nor the user is equipped to handle many of these immediately, and conversion is out of the question.

Any material or mixture which will flow so that it can be spread upon a surface and subsequently dried, forming a thin, solid film, can be classified as a paint. There are five classes of modern paints: oil, varnish, synthetic varnish, lacquer and water emulsion paints. An enamel is formed by dispersing pigment particles into these paints to obtain the desired colors.

History of Paint

Painting is one of the oldest of known arts. Painted articles estimated to be 100 centuries old have been found. However, none of these paints, estimated to have been applied between 5500 and 8000 B. C., are known to have any similarity with our modern paints. Many were earth colors mixed with clays; others apparently had an organic matter which has long since disappeared. By comparison with the 4th, 5th and 12th century B. C. articles the ancient Chinese used rice paste or glue as a vehicle. The use of drying oils and of gum resins is comparatively modern, dating back only to the 3d or 4th century B. C. Oils and resins were developed separately in different countries, and there is no record of combining the two materials into a varnish until about the first century A. D. The Egyptians used soft gums, resins and asphalt applied by melting and spreading. There is no present evidence that they used harder copal resins or any drying oils, although both the hard copal resins and linseed oil are found in Africa. Pliny describes the dissolving resins in walnut and poppy oil, both of which are drying oils, thus indicating that the discovery of varnish was somewhere about the first century B. C.

The first record of varnish making giving methods and formulations is from the records of the priests of St. Gall in the 10th century. From this small beginning until the middle of the 19th century paints and varnishes were made in secret by methods handed down from father to son with no knowledge of the chemistry involved. The majority of varnishes were made by using linseed oil as a drying oil and whatever resin happened to be locally available.

The Composition and Properties of Finishes

Paints as they have been known for centuries are really oil enamels. They are mixtures of drying oils, driers, pigments, and solvents or thinners. The natural drying oils, such as linseed and tung, are all found to be unsaturated, straight chain compounds containing 18 or more carbon atoms. On oxidation with partial or complete saturation, the oil jells producing hard, clear, rubbery or leathery films having good durability and adhesion to most metals. They are quite inert and resist the action of the elements quite well. Boiling or blowing to oxidize partially improves the flexibility, gloss and speed of drying. Blowing resists the acidity, and more recently hydrogenation and even separation of the drying oil from the edible and non-drying portion have been carried out to improve the product.

Resins are hard, horn-like and amorphous solids. Natural or fossil resins are the dried remains of pools of plant gums or saps. Age, heat and pressure have removed the more volatile or more active portions, leaving the durable resin. Films from the solution of these resins in oil have much improved hardness, brilliance, water and alkali resistance and acid resistance. The result has been an almost complete adoption of varnishes as a basis for decorative, protective coatings. Two notable exceptions are the oil finishes of gun stocks and of dining room tables. Since both of these articles are subject to very frequent minor abuse, it is much easier to pick up a little oil and wipe them a little than it is to sand out a defect in an enamel and try to refinish that.

Fossil resins are found in relatively small pockets hidden away in the earth in isolated and sparsely inhabited spots. Great variations occur in the shipments to domestic markets. Careful selections of the resins and modification of the formulations compensate for resin variation, and the mixing of large numbers of the small varnish batches during manufacture makes possible the present-day good uniformity of the oleo resin varnishes.

The greatest improvement in varnish products came with the introduction of synthetic resins. The first to be used probably was estergum. This was formed by treating ordinary resin or olophony with glycerin to form a pale, harder, stronger resin giving better moisture resistance than varnishes made from most of the usual fossil resins. The second resin was probably the use of phenol-aldehyde, sold under the trade name of

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Fig. 1: The mar resistance, adhesion and hardness of finishes are checked on this "homemade" machine which utilizes a uniformly varying weight and a Carbaloy cutter. Values are reproducible.

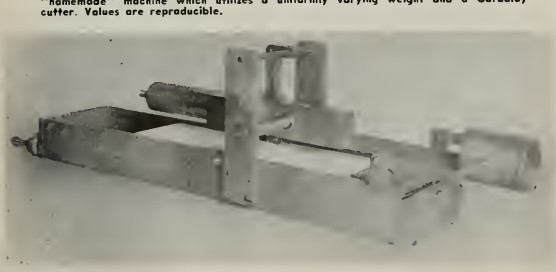




Fig. 2: Flexibility tests are made with a standard Olsen machine such as is used in the draw testing of steel.

Bakelite. This was done in 1909. Since that time several thousand plastic materials have been tried. These include both the thermosetting and the thermoplastic type, and range from very hard resins to the soft, elastic or plastic materials.

Synthetic resins may be modified by either natural or other synthetic resins to obtain the desired properties. In some cases the final polymerization or condensation of the resin or the co-reaction of several resins occurs at the same time—at the time of curing the film. In some cases they are completely reactive and dissolve in suitable solvents for use as pure varnishes. The trend is definitely toward mixtures which do not contain any oxidizing materials, the reason being the high speed of curing. It is only necessary to drive out the solvent and cure the finish by heating. The finishing time on some isolated high volume products has been reduced to a few seconds by this development. Adoption of synthetic enamels in all cases has resulted in improved quality, reduction in processing time or reduction in repairs and rejects. Another, and probably the most important, advancement due to the use of synthetic resins is that many durable pale resins are now available which do not darken during the curing cycle or during long periods of use even in warm locations. This has made possible the use of brilliant light colors and white, notably refrigerator finishes, having five to six times the durability that was possible ten years ago.

At the present time the most important resins used for finishing enamels are, in the order of their importance, phenol-aldehyde, alkyd, urea-formaldehyde vinyls, and acryloids. Among other resins now being brought into more prominent use, either to modify or replace some of the above, are melamine, maleic styrene, polyvinyl chloride, superpolyamide resins, and allyl. These resins do not include many which may prove to be even more important in the near future but which because of their color, cost, or intricate application technique, are now available only as improved, protective coatings. The more popular of these are rubber paints, and synthetic rubber-like materials. At present these are only successful when specially formulated for isolated applications. It should be remembered that each of these resin names covers a whole family of products. That is, any phenol may be a reaction of a formaldehyde, and the conditions of reaction may be changed to obtain many different grades of phenol-aldehyde.

Phthalic acid glycerin resin is the usual alkyd, and there are many grades and characteristics available. However, any resin formed by the reaction of any poly basic acid and any poly acid alcohol may be classed as an alkyd. No one clear-cut set of characteristics can be expected just because a varnish is called by its synthetic name, as an alkyd enamel or Bakelite. The characteristics in each case will depend upon the grades of the resin, percentages used, methods of formulation, and, last but not least, the method of application.

Assuming that the paint formulator has developed the optimum conditions for the varnish, a number of generalizations can be made. Alkyds improve the adhesion, water and electrical resistance of phenolics and reduce electrical surface creepage. Phenolics improve the hardness, gloss and mar resistance of alkyds. In combination with the additional modifiers, and where decorative as well as protective finishes are required, they prove the most durable metal primers known.

Urea-formaldehyde is a very durable pale resin which solidifies by polymerization on heating. It does not discolor at the curing temperature required, will withstand some excess temperature for a long time, and ages without fading or yellowing appreciably. This thermosetting plastic provides a very high speed finish. In combination with suitable modifiers it makes possible pastel colors or a brilliant white finish. It is the basis of all modern refrigerator and washing machine finishes.

Melamine resins improve the coatings having urea-formaldehyde base by improving the gloss, mar resistance, grease resistance, alkali and moisture resistance, color retention, and adhesion to other plastics such as phenolics. The resin apparently is not good alone but as a substitute for urea-formaldehyde. Its use will prob-

Fig. 3, two top pictures: This sample, checked for flexibility, foiled due to small circular cracks—the sign of a good finish.

Fig. 4, two lower pictures: If a finish is brittle, it will foil in a series of star cracks when subjected to flexibility tests.





Fig. 5: Impact tests are made by draping a 65 gram, 1" ball on a sample set at about 60°; bend tests, by bending the sample around a ⅛" diameter mandrel.

ably be confined to modifying other resin combinations.

Vinyls now provide the most chemically inert resins which we have. Unfortunately, they are readily attacked by most of the commercial solvents. They are thermoplastic. In the past the method of using these resins was to dissolve the pigmented resin chips into the most suitable solvents, usually ketones, to add plasticizers if desired, and to dilute to the desired consistency and apply. The solvent is then completely flashed off at room temperature or very low bake, and the film brought up to the setting temperature of the resin. A

Fig. 6: Bend test samples.



temperature of 250° for 12 to 15 minutes up to a maximum of 310° for a few seconds has been found to be satisfactory. Great care is required in cleaning and application, as the resin poisons easily if soluble metal salts can be formed at the interface. This causes complete lack of adhesion and eventual and rapid breakdown of color and film strength. It is satisfactory on good bonderizing but not on partial bonderizing nor on pulverant, or red type of bonderizing. Therefore extra care must be taken in bonderizing to get good results.

Acrylic resins are most prominently known from the use of methyl methacrylate plastics. This is not the best acryloid for the paint film formulation which is still a closely guarded secret. I cannot tell you whether the acrylate is used alone or modified with other resins or plasticizers. The enamel is thermoplastic and was recommended for use at the operating temperatures between —50 up to 130° F. It has very good adhesion to tin or brass.

It is not possible to consider the thousands of resins now available or being created. Some will develop and replace some of the resins discussed. It should be borne in mind, however, that a resin making an excellent plastic may not have the proper characteristics to make durable films for protective and decorative coatings. Prehistoric lacquers were simply varnishes: that is, plant or animal gums dissolved in suitable thinners. Since about 1860 commercial lacquers were assumed to be nitrocellulose base. The greatest development and improvement has taken place since 1921. By proper selection a variation of over 300 to 1 can be made in the viscosity at the same per cent solids or the weight of solids in the lacquer at the same viscosity, so that a wide variety of characteristics in lacquers can be obtained. Nitrocellulose, although tough and horny, tends to become brittle and also has no adhesion to metal. Therefore it is necessary to add suitable resins for adhesion, other resins to obtain gloss if desired, and plasticizers to retain flexibility. Resin solvents are not good nitro cotton solvents. Several completely miscible solvents must be used which are completely compatible and have the same evaporation rates, so that neither the resin nor the nitro cotton will precipitate during film formation. The rate of evaporation must be controlled so that moisture will not precipitate from the surrounding air, thus causing separation or blushing.

All of the recent improvements in varnishes and lacquers are most clearly noticeable in the decorative enamels. The pigments used must be carefully considered. All of the resinous materials used act as weak organic acids. The pigment materials may react with the acid, changing the adhesion, flexibility, durability and life as compared to the value for the original varnish or lacquer vehicle. In many cases this can be used to advantage, and improvements are made in the over-all characteristics by the use of proper pigments in the enamels.

Pre-cleaning

Pre-cleaning is the most important part of the whole finishing procedure; failure to clean properly accounts for over 90 per cent of all finish failures, provided the finish was selected to take care of the service conditions. Work must be clean and dry. If the cleaning is not complete, invisible traces of oil, grease, finger marks, or cleaning compounds may remain on the surface. Even if it is clean, corrosion may start before the finishes are applied; unremoved dirt and grease may creep out of the pores during baking. All of these conditions are not usually seen, but they will cause failures, especially if high humidity or moisture is encountered in service. Paints applied over these conditions may bridge them entirely, with complete loss of adhesion at that point, or they may absorb or react with the impurities to reduce the adhesion or to make the contact more brittle than the surface can withstand.

Metal which has been heavily swaged during forming cannot be cleaned by ordinary methods; in many cases even heavy pickling is not sufficient, and the local swaged surface must be sand blasted. Shot blasting removes some of the dirt, but it also drives some into the surface. If the protective coating is to be effective, parts to be shot blasted must be free from oil, fatty acids and dirt. Sand or shot blasted parts must be protected until the finish is applied. You cannot sand blast a surface, send it into the shop and machine it, and expect to get out the machining dirt and cutting oil.

Testing

The paint salesman is a most optimistic person, but usually in a vague

and abstract way. Therefore some method of comparison and selection must be made. We proceed as follows:

(1) Limit the suppliers to those having experience with the problem.

(2) Limit the number of samples from each to one or occasionally to two. We make it definite that we are not a development laboratory for the manufacturers.

(3) Limit number of samples to groups or series which can be carried simultaneously through all of the testing procedure so that each gets as severe a test as all the others in the group.

(4) Isolate each characteristic and test for it. (A cycle test or uncontrolled test such as painting door handles or hanging parts on the walls of chemical laboratory or plating rooms does not give any comparison to the actual service.)

(5) Where possible devise test methods which at least meet an arbitrary definition of the characteristic and give reproducible and reptitive results in numerical values without personal opinion or prejudice.

(6) Where observation and opinion must be used, make enough panels and record as many variables as possible so as to eliminate insofar as possible any personal factor.

(7) Always put an identifying mark on each specimen, then mix the specimens at random, so that like specimens may or may not have consecutive markings. This helps eliminate the personal factor.

(8) Tests are to be within the reasonable limits considering the application.

(9) It is of utmost importance to work closely with the shop and get their opinions on any new finishing material or cycle. Better finishes are sometimes harder to apply, and we must get their cooperation to get good economical and successful production.

Making Test Samples

In making test specimens, dilute, apply and cure the material exactly as the supplier specifies. Vary the dilution or substitute diluent only if necessary to get an improved result. While using the material, check for such properties as per cent solids, viscosity, viscosity as used, settling, uniformity, skinning, separation, and sprayed appearance. That is, check for dusting, drawing from edges, runs, sags, hiding power, and uniformity. After curing, check for blushing, blisters, end separation, seeding, pigment particles, wrinkling, silking, and uniformity of color and gloss. After the panels are made, it is necessary to let them season anywhere from one to three weeks if possible, since a panel that is two hours old may not stand up. On the other hand, no product gets into service so fast that it is unfair not to let them stand. Another reason for seasoning is that it tends to even out the properties of the samples; a panel two days old will be many times more durable than one that is but half a day old.

On all of the panels, mar resistance, hardness, adhesion and film thickness tests are made. The mar resistance, hardness and adhesion tests are made on one machine, Fig. 1. The panel is placed on a plane table, which moves back and forth. Over that is a tool post with a cutting tool on it, which we can move and press down and cut into the painted surface. As this panel table moves, it moves the counterbalance weight back and forth on the lever, which results in a uniformly varying weight on the cutting tool. Starting at this point, there is 500 grams on the cutter, an as the cutter moves the load on it increases to 5000 grams at end of stroke. This is a homemade method of testing for mar resistance. The point at which the cutter starts to

Fig. 7: When it is necessary to check for ultra violet fading and recovery, the standard Fadeometer is used.



scratch the surface is the mar resistance measurement. The point at which it starts to cut in and remove the top coat of enamel is the hardness figure: that is, the hardness of the film. It may be that the primer is softer and is supported a little bit by the top coat, but usually the primer is harder and the first cutting point is the hardness of the surface enamel. The point at which it cuts through to metal is what is designated as the adhesion figure. Now this also tells a number of other things about this panel. For instance, if the panel has a nice smooth cut, the material is uniform, and durable all the way through. If the fracture is brittle there is something wrong with the film. The cutter is made of Carboloy and is cutting into organic compounds and into very soft steel. In 12 years it has been repaired only twice. Other people say that this is not true hardness, and I'll agree with them with no argument at all. But this does give a numerical value that can be read, and is reproducible without personal prejudice.

The flexibility test is made with a standard Olson machine such as is used for the draw tests of steel (see Fig. 2). It is rigged up to make the Errichsen draw, with a 3/8" diameter ball, on a 1" ring. By this method the depth of the draw at the point of failure and also the character of the break can be determined. If the character of the break is of little circular cracks (see Figs. 3 and 4) it is a very flexible and good material. If the draw is very short, maybe a couple of millimeters and then a star fracture occurs, the material is always brittle; this confirms the hardness test. Whenever the material is brittle it checks on the size of the cut by this method. It also gives a definite figure at the point of failure. The only time the tests fails is when the paint is more flexible than the steel itself. This is a much better way of testing than the usual test of dropping a guillotine onto a surface, and then by observation determining which panel holds up better.

When necessary, bending tests are made using a 3/8" mandrel (see Figs. 5 and 6). New modern paint testing laboratories recommend using a cone-shaped panel. This results in a very sharp radius at one end of the panel and a very large radius at the other so that the point of failure can be determined by measurement.

On impact tests a 1"-diameter ball which weighs about 65 grams is dropped onto a panel, which is backed up on a very heavy steel backing; thus there is no indentation of the panel itself (see Fig. 5). It is simply an indentation on the paint which is just like a glancing blow of a hammer that tends to rub as well as knock off the finish. If the material is brittle sometimes one drop will do it, but if it is very ductile it may take 500 or 600 before failure occurs.

On certain types of finish it is necessary to make heat tests and aging tests to ascertain if the finish will last for ten years on a refrigerator or on a high grade fan. If the panel is put into a low temperature 100-110 C oven and baked for a certain length of time—200 hours, for instance—the increased hardness and increased brittleness will indicate how the material is aging.

A great many times, it is necessary to test for ultra violet fading and also for recovery. The regular Fade-ometer is the most reliable (see Fig. 7). Weathering cycles are inaccurate because the finish on a refrigerator, fan, or any other apparatus is never subjected to such treatment. There may be moisture, there may be water, there may be heat, and there may be light, but they vary in amount and intensity in different locations and on different samples. They do not all occur on each one. And when the test is made up of a cycle, there is no way of determining which characteristic resulted in failure. Fig. 8 shows results of some fading tests.

After a panel has been put in sunlight for a certain length of time or exposed to an electric arc, it will fade or darken, but if it is then put in the dark or kept at normal room temperature a lot of that fading will disappear. If there is any chalking or anything of that kind, the gloss can be checked by the glossimeter. It is simply a light collector and a light which reflects across the panel; the photo cells pick it up and measure the amount.

Water-soak tests are necessary on some panels and are made at about 100 to 125° F. (see Fig. 9). Some

(Continued on page 773)

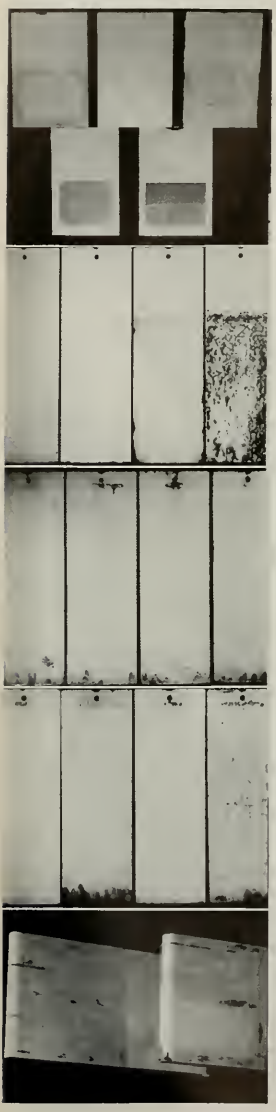


Fig. 8, top: Fading test samples.

Fig. 9, 2nd from top: Samples soaked in water at 100° F. A good finish may be from 2000 to 4000 hours before failure occurs.

Fig. 10, 3d from top: Continuous humidity samples after being subjected to 100% R. H. at 100° F. Good finishes should not fail within 3000 to 4000 hours.

Fig. 11, 2nd from bottom: Intermittent humidity samples after being subjected to a cycle consisting of 16 hours in 100% R. H. at 100° F. and 8 hours in dry atmosphere at room temperature.

Fig. 12, bottom: Grease test samples. These were covered with mixture of 50% Oleic Acid, 50% lardoil and baked at 100° C for 200 hours.

Admiralty Decisions

By Harold S. Dobbs

Recognizing the importance to the industry of a discussion of the legal problems confronting shipowners, ship operators, insurance underwriters and others connected with the vast operations of the steamship industry, Pacific Marine Review will carry a series of articles under the above heading.

In most cases they will deal specifically with cases decided by the courts of our land as well as other lands in an effort to bring home the realistic approach to legal problems that arise in the field of admiralty.—Ed.

Rights and Liabilities Under a Towing Contract

An interesting decision, concerning the respective rights and liabilities under a towing contract is presented in the case of **Wilbanks & Pierce, Inc., Appellant,** vs. **F. M. Henry, Owner of the Tug Lapwing, Appellee,** United States Circuit Court of Appeals, Fifth Circuit, in which the owner of a quarter boat filed a libel in rem[1] against a tug to recover damages for the injuries sustained by the quarter boat while in tow of the tug. The tug tied up the quarter boat during the course of the tow, and the next morning, the tide having ebbed, the quarter boat settled on submerged piling, piercing the hull and causing her to sink. The owner of the quarter boat claimed negligence by selecting an improper place to moor, and appellee's answer denied the negligence and affirmatively alleged that the mooring of the tow was in the safest and best place known to the tug. The court reviewed and cited as authority the decision of **Stevens** vs. **The Vessel White City,** 285 U. S. 195, in which it was held "(1) that the tug is not a bailee[2] of the vessel in tow or her cargo; (2) that a suit by the owner of the tow to recover for an injury to the tow caused by negligence on the part of the tug is an action ex delicto;[3] (3) that the tug is not liable as an insurer or as a common carrier, but owes to the tow the duty to exercise such reasonable care and maritime skill as prudent navigators employ for the performance of similar services; and (4) that the mere fact that the tow was in good condition when received by the tug, and in damaged condition when delivered, does not raise any presumption of faults on the part of those performing the towage services." The court concluded that the Stevens decision was sound and that the action for loss of the tow was **ex delicto** (tort)[4] and that a presumption of negligence did not arise from showing that the tow had been damaged.

Many shipowners are lulled into a false sense of security during the period a vessel is in tow by an erroneous assumption that the tug is a bailee of the vessel in tow as well as her cargo. As you can see, this is not the state of the law and the tug is not in the position of an insurer or a common carrier.

[1]By proceedings "in rem" the property itself can be made available to answer the claim, and be proceeded against.

[2]A bailee is a person to whom goods are entrusted for a specific purpose.

[3]An action "ex delicto" is for an injury which formerly had no specific legal remedy and which requires special writs to be issued.

[4]Injury or wrong.

Maintenance and Cure Responsibility in Case of Seaman's Injury or Sickness

The subject of maintenance and cure has always been and will always be, I suppose, interesting to shipowners, operators and underwriters in view of the peculiar positions taken by the courts of this land in seamen's claims for such maintenance and cure. In a decision by Augustus N. Hand, Ct. J., in the United States Circuit Court of Appeals, Second Circuit, **Allen Moyle, Plaintiff-Appellee,** vs. **National Petroleum Transport Corporation, Defendant-Appellant,** plaintiff seaman's judgment, obtained in the District Court, was affirmed, arising out of a claim for maintenance and cure after the plaintiff seaman had received a discharge slip from the Marine Hospital which indicated that no further hospitalization was then necessary.

It is a very normal thing for a seaman to appear before the claims representative of a steamship company or counsel representing the company and exhibit a Marine Hospital discharge slip as the prerequisite to obtaining settlement of his maintenance and cure claim. In 99 out of 100 cases, the claims representative or the attorney accepts the Marine Hospital discharge slip without further question and assumes that the seaman's claim for maintenance and cure from that point on is at an end. However, a different result follows in the case at bar where plaintiff as seaman on the defendant's vessel joined the ship November 9, 1936, in the capacity of oiler, and later became ill with symptoms of headaches, fever and continuous coughing, to such an extent that he was unable to continue his work or to stand further watches. He was given a certificate for hospitalization by the master of the vessel and approximately four to five weeks later reported to the Marine Hospital, remaining in the hospital for a period of ten days. The Marine Hospital's diagnosis was "common cold, asthma, bronchial." He was discharged with the notation on the hospital records of "N.F.H.N." which stands for "no further hospitalization necessary." About six or seven weeks later his asthma returned and he reported again to the hospital from which he was discharged. However, there was no further change made in the discharge certificate. From that point on he secured medical treatment by local physicians in different parts of the country to which he traveled in search of a climate more suitable to his asthmatic condition. Five and a half years later, and almost eight years to the date of trial, the seaman instituted an action for maintenance

(Continued on page 765)

(The author is associated with the law firm of Lillick, Geary, Olson & Charles, San Francisco, California.)

Long-Range Navigation



A Loran receiver indicator in use at a monitor station. The same equipment is used aboard ship for taking Loran time difference readings.



Shielded communications room, showing communication transmitter at right and receiving equipment in the rear. These communications rooms must be thoroughly shielded in order to prevent interference with the Loran signals by this equipment.



Erecting the vertical radiator (or main antenna) of a Loran station. These are of all-steel construction and are built in sections.

Coast Guard Cites Advantages

Loran, science's war-born technique of long-range navigation, has numerous advantages over all previously developed systems of navigation, according to a detailed explanation released by the United States Coast Guard.

Keying scientific developments resulting from wartime studies in electronics, the Coast Guard is making the many advantages available to the maritime world.

Following are the advantages of the new system of long-range navigation:

(1) Accurate fixes may be obtained up to 800 miles from the transmitting stations during the day and 1400 miles at night.

(2) It is almost independent of weather.

(3) No transmission from plane or ship is necessary.

(4) Expeditious fixes may be obtained.

(5) Fixes are independent of compass, chronometer, or other radio or radar sets.

Loran is a word coined from a descriptive phrase of the system LOng Range Aid to Navigation. Loran provides quickly and accurately, in any type of weather, data which enable the navigator to establish his position in a matter of about one or two minutes. There are, at present, no other navigational aids which will provide for the navigator the same consistent fixes under all conditions of weather, of distance from the shore units, and of position relative to the units. The more common direction finding systems, such as HF/DF and radiobeacon systems, even after 25 years of service, cannot offer the same degree of dependability,

under conditions mentioned above, because of certain inherent factors in the propagation of radio waves which limit their capabilities.

Loran is inherently a good system because only the most dependable factors of radio wave transmissions are utilized. By this it is meant that there is no reliance placed on the apparent direction from which the signal approaches as in ordinary direction finding, since this is not important and is subject to considerable errors caused by travel over land masses and sky waves. The velocity of a wave is considered constant, there being only extremely minute variations in air and because the speed is constant, the time of travel can be determined with great accuracy. Loran depends on the latter stable factors.

Heretofore the navigator of surface vessels utilizing the conventional means of obtaining fixes by celestial observations did not usually consider it necessary to have accurate positions while at great distances from land. Because of the war, fixes of accuracy throughout ocean areas became necessary so that convoys and air cover could rendezvous quickly. More accurate knowledge of positions under any weather conditions is of peacetime importance to fast ships in holding desired courses for reasons of economy of operation as well as avoidance of collision. Another wartime use and equally important peacetime use is the location of ships and planes in distress. By giving Loran coordinates rather than geographical ones, objects can be located much more easily since it becomes unnecessary for the navigator to compute drifts, sea currents, winds, etc., which are necessary when using ordinary navigational methods. The user simply sets the course which keeps him on a desired Loran line of position. It can be seen that in the case of aircraft when it no longer becomes necessary to take time- and gasoline-consuming drift meter readings, and by having an exact position at all times by Loran navigation, the pay load can be increased by reducing fuel reserves. Actual cases have been recorded of increases of 1000 pounds in pay loads by using Loran.

To illustrate the Loran principle, let us consider the following example: Let two men, A and B (Fig. 1), be standing **together** at a point (X). Also have an observer with a stop watch at any point (P). Then A is told to walk directly to the observer and B is told to walk first to another point (Z) and then to (P). It is assumed that both men will walk at exactly the same velocity and leave the original point at the same time. Then if the observer at (P) starts his stop watch when A reaches his position and stops it when B arrives, the reading on his watch will be the time difference between the arrival of A and B. Let us say this time difference is 30 seconds. There are many points where the man with the stop watch could stand and have (A) and (B) arrive 30 seconds apart. If all of these points were connected with a line, we would obtain a Loran line of position. This line of position serves the same purpose as one obtained by a star sight. Where two lines of position cross, whether Loran or celestial, is the position of the observer, or his "fix."

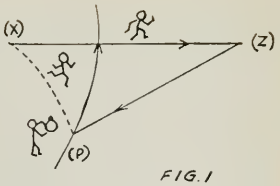


FIG. 1

This analogy of the men A and B walking can be readily converted to explain the electronic principle of Loran. Points (X) and (Z) would represent two Loran transmitting stations. Man A would be the electrical impulse which goes directly to the observer and Man B is the same impulse which first goes to station (Z) and is retransmitted to any point (P). The speed with which the men move is the velocity of a radio wave and the observer's stop watch represents the electronic stop watch or receiver-indicator which converts the difference in the time of reception of these electrical impulses into a visible time difference reading on a cathode ray tube.

Loran is a very accurate system. Theoretically with all human errors removed, fixes could be obtained which would be in the neighborhood of 100′ in error. If certain refinements now in development are placed in general use this will be even further reduced. With an accuracy as great as this, Loran will be usable for work as exact as surveying, both hydrographic and overland. At present the system is guaranteed to give accuracy to at least one per cent of the distance from the most distant station. Thus if the observer is 1000 miles from the station, he can locate himself to within ten miles of his true position. This is sufficient accuracy when the ship is far at sea. Loran has greatest accuracy on or near the perpendicular to the line between the stations. This is because the hyperbolas are spaced more closely there and there is a relatively small distance for each unit change in reading.

The shaded areas in Fig. 2 represent an area of low accuracy because the lines in this area are spaced so far apart that a minute error in reading results in a large error in the line of position. However, the stations are arranged so that in the area of low accuracy for any one pair there are lines of good accuracy from other pairs. The transmissions are monitored constantly by fixed indicators whose positions are known as accurately as the transmitting stations, and any small variation in the system is immediately detected and corrected.

The present Loran has a daytime range of from 600 to 800 miles. However at night, when transmitting conditions are good and the ionosphere can be utilized to reflect radio waves, the effective range increases to 1400 to 1500 miles. The use of the re-

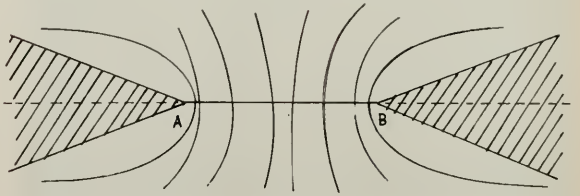
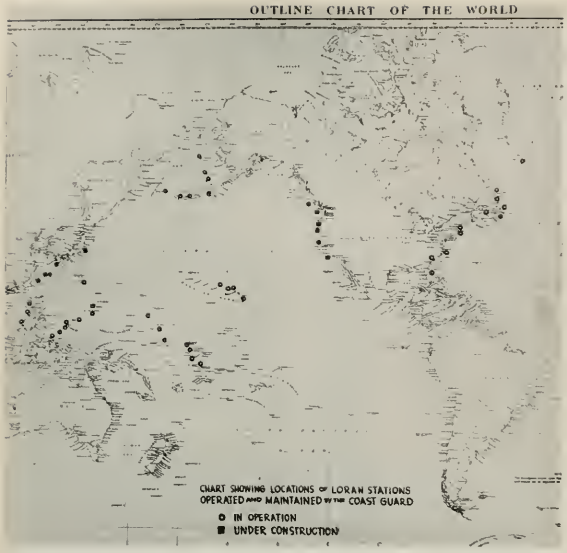


FIG. 2



flected waves at night requires some skill at matching the signals; however, with but a little practice any operator can master the technique. There is under experimental development (not ready for release for a year or more) a new type of Loran using exactly the same principles which will increase the daytime range to 1000 to 1500 miles and the night range to 2000 to 3000 miles under light noise conditions. The accuracy can be increased to 1 or 2 miles at 1000 miles from the station. The service area of the present standard Loran is only about 1,000,000 square miles for a chain of 3 stations (2 rates), but this will be increased to about 5,000,000 square miles when the new Loran is ready for use in the future. With Loran as it is now, only 150 stations will be required for world coverage.

Chart of the world, showing area covered by present Loran service. These areas will soon be increased by stations now under construction and planned.



The valuable features of Loran may then be summarized:

(1) Accurate fixes may be obtained up to 800 miles from the transmitting stations during the day and 1400 miles at night (this may be extended to over 2000 miles with new equipment which is still in the experimental stage). The accuracy is comparable to that of good celestial observations and is about 1 per cent of the observer's distance from the station.

(2) It is almost independent of weather. It works under all conditions of sea and air except when noise conditions are very high. This limitation will be removed when new anti-precipitation static devices are available.

(3) No transmission from plane or ship is necessary, permitting any number of observations to be made by ships on the same station.

(4) Good and reliable fixes may be obtained in about two minutes by an experienced operator. There are no calculations necessary.

(5) Fixes are independent of compass, chronometer, or other radio or radar sets. Only special Loran equipment is used, which weighs 35 pounds and up, depending on the model.

Work was commenced on Loran in 1941, and by the end of 1942 the first of the ground stations which were later to lace the world with the electronic lines of position were operating. First stations were set up in the North Atlantic area by the National Defense Research Council, under the sponsorship of the Navy, and were taken over completely by the Coast Guard.

The North Atlantic chain was established in midwinter of 1942 during the Battle of the Atlantic, and the Aleutian chain later in the same year and in the spring of 1943. The intensity of weather and the rough terrain made the establishment of these stations a hazardous operation. Engineers and electronic specialists of the Coast Guard aided in the construction of these early stations. Loran stations were later set up and operated in the Pacific Area. Thus Loran service is now afforded navigation along both coasts of North America, along the busy great circle courses of the North Atlantic and North Pacific, and in the central and southwest Pacific, where pin-point navigation is essential.



Large Seagoing Dredges For U. S. Army Engineers

FOUR 352-FOOT SEAGOING hopper dredges—largest all-welded craft of this type—will be built by The Ingalls Shipbuilding Corporation at its Pascagoula, Miss., yard.

The yard, which was the first in the world designed and constructed for the exclusive use of the all-welded method of building big ocean-going ships, will deliver the dredges to the Corps of Engineers, U. S. Army. The design and construction of the dredges are under the supervision of the U. S. Engineer Office, Philadelphia, Colonel F. F. Frech, C. E., District Engineer.

The ships, powered and equipped to go any place in the world to dredge a harbor or channel, will cost approximately $4,250,000 each. They will have every modern navigation aid and will be capable of traveling between the dredging site and dumping ground at a speed of 13 knots—enough power to buck the strongest currents while pumping silt and sand from the river or harbor bottom.

The Ingalls yard will deliver the first of the dredges in August, 1946.

In appearance, the dredges will look a great deal like twin-screw bulk cargo vessels, but where the cargo holds would be there will be instead large hoppers, with sloping sides, into which the dredged material is pumped by centrifugal pumps. The hoppers will have a total capacity of 3000 cubic yards, and even when the hoppers are filled with the heaviest type of material the vessel will have sufficient buoyancy to keep it well afloat.

The main propelling machinery will be of the direct-current, turbo-electric type, with 6000 shp normal full power. The power will be generated by two main turbo-generators, and the propeller shafts will be driven by two direct-connected electric propulsion motors. Steam will be generated by two water tube, oil fired, marine type boilers equipped with automatic combustion control. Complete auxiliary and "stand-by" machinery and equipment also will be provided.

The propulsion motors will be operated by the variable voltage method, and in this way they will be controlled from zero to full speed in either direction by varying the field excitation of their respective generators. To insure the most positive control at all times, there will be two control stations, one at the main switchboard in the engine room and the other centrally located on the bridge. Either of these stations will be able to perform the complete electrical propulsion control functions.

The dredge pumps will consist of two centrifugal, volute pumps, one right hand and one left hand. Each pump will have a direct connected motor rated at 1150 hp, and a waterproof drum controller, having at least 20 points of control, will be installed in each dragtender's house in order that the operators may have complete and instantaneous control over the dredging machinery.

In the actual dredging operation,

when the vessel reaches the area to be dredged, suction pipes, pivoted to the sides of ship and fitted on the outer ends with heavy drags, are lowered to the bottom. The dredge pumps are then started, and the vessel moves at a speed of two or three miles an hour along a predetermined course, which is indicated by buoys or range markers.

The suction action of the pumps picks up the sand or silt, mixed with water, and discharges it into the hoppers. The solids settle to the bottom, and the water flows over the upper edges of the hoppers and out through the sides of the dredge. After the hoppers are filled, the drags are raised and the ship proceeds to the dumping ground.

The "dumping ground" is a place where the depth of water is sufficient to allow for the discharge of material from the hoppers where it will not be an obstruction to navigation. When the chosen dumping ground is reached, the hoppers are opened and the material flows out by gravity. It is displaced by water which comes in through the open doors, and when all the sand or silt is discharged, the hopper doors are again closed; the dredge then proceeds back to the dredging area, and the process is repeated.

The new dredges being built by Ingalls will be entirely seaworthy, and able to move rapidly out to sea from a harbor to discharge the dredged material in the disposal area, and then return at full speed to resume dredging in a minimum of time.

Deepening of a harbor or channel is carried out by skillfully running the dredge back and forth over the shoal area and carefully lowering and raising the drags in order that they will maintain contact with the bottom. This process cuts a series of parallel furrows in the bar, and the ridges gradually fill in the hollows by erosion, the result being a smooth plane at the required depth.

This complicated process requires the very best and most efficient machinery, and these new hopper dredges will have not only the powerful, perfectly controlled propulsion machinery and pump motors but also full automatic equipment designed to facilitate operations and to protect all the machinery from overloads and from damage when controls are suddenly thrown from one extreme position to another.

In addition to the extensive and modern equipment and machinery with which the four dredges will be provided, the seaworthiness of the vessels will be further insured by four watertight bulkheads. A hydraulic system for operating the bulkhead doors will be installed, and a single control in the pilot house will close all doors at any time, irrespective of whether the hydraulic pumps are in operation or not. Further, each door will be provided with local controls and operating gear to enable it to be operated locally from both sides of the bulkhead.

Thus the new dredges, which will have ample freeboard, are so designed that they would not sink if an accident of some kind should cause any two watertight compartments to be flooded, with full load aboard. The ships also will have bilge keels to minimize the roll in a seaway.

Other factors which will contribute to the ease and highest efficiency of operation of the vessels will be all the latest—many of them just developed during the war—aids to navigation that are to be installed in each dredge. These will enable the ships not only to move with the utmost precision during dredging operations but also to travel direct, just as any ocean liner or warship, to any given spot on the high seas.

The dredges, which are being constructed by the most skilled craftsmen in the business, will incorporate features that should make them valuable additions to the Army Engineers' dredging fleet. They are certain to have a major part to play in the harbor improvement programs that have been projected as post-war jobs for the Engineers.

New Delta Liners

THREE COMBINATION passenger-cargo vessels—first and finest of their type—are now being built at the Pascagoula, Miss., yard of the Ingalls Shipbuilding Corporation.

Scheduled to make their maiden voyages as queens of the South America run next spring and summer, the ships are designed to provide passenger accommodations exceeding those of pre-war luxury liners and they will be equipped with the most modern cargo-carrying facilities.

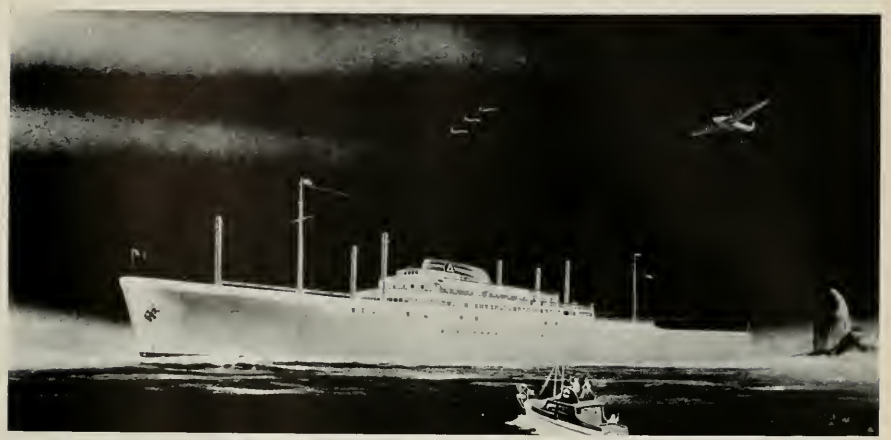
The ships, which will be delivered to the Mississippi Shipping Company for service on its Delta Line, are modifications of the C-3P in design—489 feet in length, with a breadth of 69½ feet and a depth of 45½.

The three 17,000-ton ships which will be built at a total cost of more than $16,000,000, will be air-conditioned throughout, being the first passenger-cargo vessels to have this feature for all aboard, including the crew.

For the convenience of the 120 passengers, each ship will feature a glass-enclosed promenade, outdoor swimming pool and sundeck, cafe and bar, grand salon and library, midship passenger elevator and a modern shopping center. There won't be any worries about getting an outside stateroom, because a unique arrangement of bedrooms with strategically placed windows will provide a clear view of the sea from every one. The bedrooms and apartments will have fresh water showers, extra-length beds with innerspring mattresses, ample wardrobe locker space and modern furnishings.

Lounges and clubrooms will be separated by partitions of glass, which provides satisfactory soundproofing yet creates the visibility and air of spaciousness which is so all-important to travelers aboard ship.

A new method of disposing of smoke and gases high above the deck also will be featured on the new ships. The huge teardrop stack, built of aluminum, will be false and will



This drawing prepared by George G. Sharp, naval architect, of the new Delta Line ships now being constructed by Ingalls emphasizes the streamlined beauty of the finest vessels ever to make the New Orleans-South American run.

provide two decks for officers' quarters, emergency generator and radio room, and the real "stack" will be a hollow mast which will discharge smoke and gases high above the deck, making it cleaner and more comfortable for passengers.

Murals and paintings depicting old New Orleans will be combined with the greater use of glass and modern, soft-colored fabrics to give the vessels the pleasing tone of a well-appointed private club.

The Del Norte, Del Sud and Del Mar will be just as up to date in arrangements for carrying cargo. Each will have seven cargo holds, and approximately 70,000 cubic feet also will be refrigerated and so arranged that it can be used for carrying additional cargo.

All holds except those provided with refrigeration will be equipped with "Cargocaire"—a system to control humidity and prevent sweating and consequent damage to cargoes.

The ships—finest ever to make this South American run—will make the trip from New Orleans to Rio de Janeiro in 14 days and to Buenos Aires in 20 days, stopping en route at Santos and Montevideo. Delta Line plans to use the ships on a 47-day luxury cruise from New Orleans to Buenos Aires and return, allowing a week in the Argentine, three days in Rio and sightseeing trips in Santos and Montevideo.



Decks on the Ingalls-built Delta Line passenger-cargo ship are perfectly flat. This drawing is of the recreation deck.

Corner of the deck cafe and clubroom where large glass doors can be pushed back to turn the deck into a part of the open deck.



Pacific WORLD TRADE

Reg. U. S. Pat. Off.



By T. Douglas MacMullen

Grace Line's Post-War Plans

"When can we take a Grace Line cruise?" is a question which is being asked many times daily of members of the Grace Line organization both here and abroad. The day when service will be resumed is fast approaching—yet in the meantime the "Santas" still have many war tasks to perform. Supplies must be carried to far-flung occupied territories; troops redeployed and evacuated; the sick and wounded returned to their homelands; and prisoners exchanged. For the present, Grace Line continues to provide freight service with ample space for all cargo moving between the Atlantic, Gulf, and Pacific coasts of the United States, and the west coast of South America; and between New York and the Caribbean, Venezuela, and Colombia, with modern freighters assigned to these routes by the War Shipping Administration.

W. R. Grace leaving the Golden Gate. In the 1870's the W. R. Grace made the New York, Callao, San Francisco run via Cape Horn in 115 days.



Despite the fact that its ships are thus occupied, the Grace Line has its post-war plans well under way.

Moreover, mindful of its obligations to the shipping and traveling public, the company with the cooperation of the United States Maritime Commission, carried on throughout the war its shipbuilding program started before the outbreak of hostilities—each vessel, as it came off the ways, being assigned to active war duty by W. S. A. officials.

Under this program, new ships have been built faster than sinkings have occurred so that the Grace Line will have a fleet of 18 new "Santa" ships with which to resume and expand its services linking the Americas. The new fleet will consist of nine combination passenger-and-freight ships and nine cargo vessels. The latter have all been completed and been entered in war service. The former are under construction—with deliveries to start in February, 1946, and to be completed in July of that year. All the new ships, following Grace Line tradition, will be named for "Santas" which formerly were members of the fleet.

Serving with the new ships will be the Santa Rosa and Santa Paula, only Grace Line cruise ships to survive the perils of the war.

The nine new combination passenger-and-freight liners are fast, efficient ships which will provide attractive accommodations for fifty-two first-class passengers. These new passenger ships will be equipped with swimming pools, sport decks, movies and other facilities for recreation. Staterooms all will be outside rooms and each will have a private bath: and all public rooms and staterooms will be air-conditioned—the first complete application of this feature to passenger accommodations in the Latin-American shipping trade.

The new ships will make possible double the prewar number of passenger sailings from New York, both to Panama and the west coast of South America, and to the Caribbean.

These more frequent sailings will operate to the advantage of both travelers and shippers. With these liners leaving every week, on regular schedule, the traveler can select the departure date which best meets his requirements, and can stop off along the way—picking up another Santa ship within a week if he so desires—thus avoiding the necessity of delaying his departure, or making prolonged stop-overs because of less frequent sailings.

Routes Covered

The Grace Line's program for post-war service on its long-established routes to Latin America provides for:

1. Weekly passenger-and-freight service from New York through the Panama Canal, covering Colombia. Ecuador, Peru, Bolivia and Chile—to be operated with the new combination passenger-and-freight ships.



Artist's conception of Grace Line's new combination passenger and freight ships.

These new ships will replace the Santa Lucia and Santa Elena, which were sunk in war service in the Mediterranean during the African invasion and the Sicilian campaign respectively; and the Santa Clara, which was lost on D-Day off France. This new weekly service will provide double the number of passenger sailings that were available in the period immediately preceding the war.

2. Two passenger-and-freight services every week (instead of one, as formerly) from New York to the Caribbean area, and the north coast of South America.

One of these weekly services to this area will be maintained by the Santa Paula and Santa Rosa. Before entering service, they will be completely modernized, redecorated, and refurnished, and, it is expected, will be enthusiastically received by travelers with whom they enjoyed great popularity before the war. The other one of these weekly services, it is planned, will be provided by the new combination passenger - and - freight ships.

In Venezuela, these ships will provide regular, fast service to ports previously visited by Santa ships and to additional ports, including Maracaibo, which never before have been visited regular by American passenger liners. This is particularly important to Maracaibo, one of the great oil metropolises in the world, one of the country's chief coffee shipping points, and a leading factory center. This port will now be brought into direct communication with New York by passenger liners; and thus the necessity for trans-shipment will be eliminated. In Colombia, it is planned, the ships will cover both Barranquilla with its new terminal facilities, the clearing point for the rich valley of the Magdalena River; and Cartagena, which with its elaborate modern port works is one of the country's leading seagates—both are popular tourist centers.

3. Regular service by fast cargo ships with limited passenger accommodations from U. S. Atlantic Coast ports other than New York to Panama and the West Coast of South America.

4. Sailings every three weeks from ports of the U. S. Pacific Coast to West Coast ports of Mexico, Central America, and South America by

Santa Paula, which with the Santa Rosa will be completely refurnished and decorated for the Caribbean service when released from transport duty.















new, fast cargo vessels with limited accommodations for passengers.

5. Direct service every three weeks from Houston, Galveston, New Orleans and other Gulf ports, via the Panama Canal to the west coast of South America to be provided by fast, new cargo ships with limited accommodations for passengers.

The more frequent sailings on passenger routes will enable the Grace Line to plan a wide variety of extensive shore trips by plane, motor, and train from ports included in the cruise itineraries to fascinating cities and tourist centers in the interior.

Advantages of New Schedules

Particularly attractive are the air-sea trips which can be arranged. On the west coast of South America, Grace Line ships will make convenient connections with Panagra planes serving cities in the interior, and operating to Brazil and Argentina, and to points in Bolivia where connection is made with Lloyd Aereo Boliviano planes. Connections will also be made with Faucett Aviation Company planes covering points in the interior of Peru not included in Panagra routes. On the north coast of the continent, connections can be made between Santa ships and the planes of Pan American Airways and Aviana which serve Colombia.

Artist's conception of accommodations on new passenger and freight ships. Reading down: Lounge, club, dining room, veranda overlooking swimming pool, double stateroom. Below is shown the Santa Elisa, C-2 type cargo ship to be used in conjunction with combination passenger and cargo ships and the Santa Rosa and Santa Paula on Grace Line routes.

In connection with voyages to the west coast of South America from New York, interesting tours can be arranged for passengers stopping off along the way . . . in Panama, to fishing centers, beaches, jungle settlements, and to the nearby isles of the San Blas Indians . . . in Colombia, an overland tour to Bogota, the inland capital described as the "Athens of South America" . . . in Ecuador, the flight from Guayaquil to Quito, a typically Spanish colonial city set among some of the most magnificent peaks in the Andes, capital of the republic, and one of the three oldest cities in the New World . . . in Peru, excursions from Lima, the capital city, to intriguing Indian villages and mining centers; to Cuzco, heart of the Land of the Incas, with its amazing ruins of cities centuries old; to La Paz, skytop capital of Bolivia; and to Tingo Maria, the new tourist center in the jungles of eastern Peru . . . and in Chile, tours from Santiago to the country's excellent deep-sea fishing centers, the Araucanian Indian settlements, the Lake District with its ski resorts, ranches, thermal springs, lake resorts, and fresh-water fishing centers; and a thrilling flight by Panagra plane over "the Hump" to Buenos Aires.

The twice-a-week sailings to the Caribbean and the north coast of South America from New York offer to commercial travelers more frequent service between Venezuela, Colombia, and New York; and to tourists, the choice of making the complete cruise within the limits of the two-weeks' vacation, or of extending it over a longer period.

By taking advantage of the stop-over privilege . . . passengers can remain in Caracas, Venezuela's charming capital city, long enough to do as much sightseeing as they wish; to play tennis and golf at the city's luxurious clubs; and to drive through some of the most gorgeous mountain regions on the continent to interesting Spanish colonial cities . . . in Colombia they can stop off in Barranquilla at the beautiful Hotel del Prado for motor trips to cities in the interior, or over the new coastal highway to Cartagena, a picturesque walled city more than four centuries old which once was a leading stronghold of the conquistadores and today is an important modern port.

In short, the more frequent sailings on Grace Line passenger services en-

able travelers "to write their own ticket"—they can make a continuous trip on one ship, or stop off along the way in the countries which most appeal to them.

In commenting upon the plans for post-war service, R. Ranney Adams, President of the Grace Line, said:

"Our experienced masters, officers, pursers, and stewards have rendered valiant service to their country during the war. Their many friends among the pre-war traveling public will find them on hand to greet old friends and new, aboard the ships of our fleet.

"We are pleased also to announce that the Santa Rosa and Santa Paula, familiar to thousands of travelers, will soon again be carrying passengers on business trips and pleasure cruises. These two ships have rendered service of incalculable value during the war in the transportation of troops and supplies to all the battle zones. Although still engaged in returning our victorious troops to this country, they will soon complete that happy task, and, after being reconverted and redecorated, will return to their prewar route covering the Caribbean, Venezuela, and Colombia.

"The war loss of the Santa Lucia, Santa Elena, and Santa Clara, well known along the west coast of South America, as well as the loss of other vessels of our fleet, is being offset as rapidly as possible by the building of new ships—which although accommodating fewer passengers will provide double the number of sailings as were available in the period just preceding the war.

"Our construction program is well advanced and by early 1946, it is expected, we shall not only have replaced our war losses, but shall have a new efficient fleet of substantially greater capacity than that of our pre-war fleet. We hope soon to be able to announce the definite dates on which these new post-war services will be available.

"The new combination passenger-and-freight ships will be of the type which, we are sure, will attract a following quite as enthusiastic as that of the Santa Rosa and Santa Paula. In fact, the same interior decorators and principals who were responsible for the beauty and homelike atmosphere, the speed and efficiency of those popular liners, have contributed to the designs of the new ships.



Santa Rosa passing under the Golden Gate Bridge (1937), en route to Los Angeles, Mexico, Central America, Colombia, Havana and New York.

"Our new cargo vessels, generously provided with space for refrigerated cargo, will provide better, faster, and more efficient service, for the increased volume of trade between the United States and Latin America which the post-war years are confidently expected to bring about.

"Indeed we believe that our new fleet will not only help to meet but also to increase the post-war volume of travel and trade between the two continents."

Santa Lucia and Santa Paula leaving New York harbor (1936), the former en route to West Coast of South America and the latter bound for California ports.



The American Merchant Marine and Foreign Commerce

By E. Russell Lutz

Executive Vice President, American President Lines

Keeping in mind California's very special interest in overseas commerce, let us reverse the sequence of title and first discuss the subject of the extent to which international trade is important to the United States and to California.

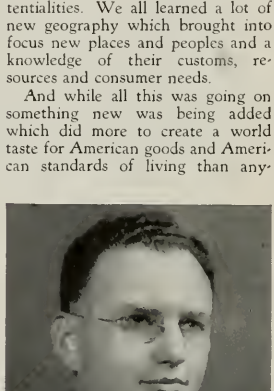
There is ample evidence, accumulated over the years, to show the value of foreign commerce to our economy, both state and national. The logic and mathematics of this evidence are irrefutable. However, under present world conditions, the question of America's full-scale participation in international trade transcends any consideration of mere domestic economy. Today we are faced with a duty, with the force of a moral obligation, to use our great productive capacity and our transport facilities to assist in the reconstruction and rehabilitation of the nations devastated and impoverished by war.

In fulfilling this obligation we not only help the rest of the world to a fuller life and to higher standards of living, but we aid our own economy in a very substantial way by creating more jobs for our people and by increasing our national income. Normally, foreign trade represents ten per cent of our total trade and provides approximately 5,000,000 American jobs. This margin can well mean the difference between profit and loss in our national balance sheet. It can also mean the difference between depression and prosperity.

Fortunately, foreign trade is not something static with fixed limitations. There is no limit to human wants. And there should be no satiation point in our development of overseas markets, nor our enriching our own standard of living by making use of the products of other lands around the world. This is especially true of the years immediately ahead.

The war gave us a whole new concept of the world and its trading potentialities. We all learned a lot of new geography which brought into focus new places and peoples and a knowledge of their customs, resources and consumer needs.

And while all this was going on something new was being added which did more to create a world taste for American goods and American standards of living than any-



E. Russell Lutz

thing that ever happened in the long history of economic evolution. I refer to our program of Lend-Lease. No "sarong-settlement" in the deepest jungle was so remote as not to feel the effects of, and be influenced by, Lend-Lease.

Lend-Lease has been called "the greatest promotion job the advertising world has ever known." It dispersed American goods to the four corners of the earth, and everywhere they have been found good. Our products of farm and factory were so widely broadcast and advertised during the war that we managed to keep most of our old markets and in addition created many new ones. All of these markets, old and new, now afford lucrative outlets for the many new American commodities and appliances born or perfected in war's research laboratories.

But these markets, promising as they are at the moment, should be followed up and developed without undue delay if we are to reap the harvest of goodwill generated by Lend-Lease. Unless we do so, with intelligence and vigor, we will have missed a trading opportunity such as this country never had before and may never have again.

Taking full advantage of attractive world trade situations, however, is dependent on many factors other than "Yankee ingenuity" and advertising follow-up:

First, we must maintain a strong American Merchant Marine — our own pickup and delivery service—so that the movement of our overseas commerce will not be at the whim of ships of other nations. We should strive for a rich and expanding volume of world trade with our own ships in every sea to guarantee its delivery.

Second, to take full advantage of our overseas markets we should have full employment and maximum production here at home.

Third, we should use our full resources and every known device to have our trade become a two-way trade, so that we could balance as nearly as possible our exports with imports.

Our goal of full employment at home is inescapably linked with a lively and relatively free exchange of goods abroad. If we can achieve our domestic goals, United States exports can well exceed ten billion dollars annually, according to recent Department of Commerce estimates. This would be twice the total of our exports in the banner year of 1929, and three times our annual total in the years immediately preceding the war. In terms of employment, according to the Department of Commerce, ten

(Text is from an address before the Industrial Session, California State Chamber of Commerce, Los Angeles, California, November 29, 1945. Mr. Lutz is also president of the Pacific American Steamship Association.)

billions of exports would mean 2½ million more jobs than were provided through foreign trade in the late 1930's. In those years it was estimated foreign trade accounted for approximately five million jobs.

Such a volume of trade, however, cannot be sustained on the basis of exports alone. We must devise ways and means of providing dollars to our overseas customers in sufficient amounts to pay for our goods. This is done generally in three ways:

(1) Through imports;
(2) Through expenditures abroad, particularly travel;
(3) Through profitable investments abroad which will stimulate trade and provide credits for our foreign buyers.

I realize this makes the problem sound very simple. As a matter of fact it is difficult and complex. It will require a great deal of exploration and resourcefulness on our part to find new uses and new markets for foreign goods in this country. In this connection I might point out that steamship companies themselves do a great deal to stimulate and encourage two-way trade because, as a matter of economic necessity, ships must have cargoes inbound as well as outbound. The overseas' staffs of American shipping companies have to get out and hustle for cargoes, just as our domestic organizations cooperate in finding new and expanding markets for the foreign cargoes brought to our shores.

Robert Earle Anderson, Director of Finance of the U. S. Maritime Commission, whose recent book, "The Merchant Marine and World Frontiers," is a highly valuable contribution to the subject which I have for discussion today, emphasizes the trade development angle of our merchant marine in these words:

"It is quite common to think of our merchant vessels merely as a means of transportation. Those who take this view argue that the ships that carry our trade are best operated by whatever maritime peoples can perform the service most cheaply. If our commercial problem had to do only with the physical outward movement of our exports, there would be some merit in this contention. Exports tend to force themselves out of the country, and exporters are not generally concerned with the flag of the vessel that carries their product. But there cannot be an outward flow of exports without a corresponding inward flow of imports. The commercial importance of an adequate merchant marine arises largely from this fact."

Incidentally, I should like to commend to you for careful reading, if you have not already done so, Mr. Anderson's very excellent book. I am sure you will find it both fascinating and informative. He has captured the knack of treating a traditionally dry subject with the romance and sustained interest of a best-seller.

But to get back to the subject of providing our foreign customers with the dollar exchange to buy our goods, there is the second item of expenditures abroad, such as those provided by our citizens traveling in foreign countries. This was already a big business in the pre-war days. Just imagine, then, what it will be when all restrictions are off and the millions of our people with bulging bank accounts start venting their long-pent-up desires to "go places and see things!" The stampede for steamer

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space that followed the first world war will look like a faint trickle compared to the deluge back of the floodgates now.

A recent poll of our company passenger offices throughout the country revealed an amazing backlog of request reservations, all preferably for the "first ship out" after the liners are returned to commercial operation. Hundreds of these advanced bookings represent former patrons who are hungering for another cruise to the Orient or around the world. Some are former residents abroad who were repatriated because of war. Many others are newcomers who have never before been to sea.

E. E. Schnellbacher of the Department of Commerce, in a speech last month before the Merchant Marine Conference, said that, "the estimate that travel outside our country may put considerably more than a billion dollars a year in the hands of other nations seems entirely reasonable."

In the matter of investments aboard, we must furnish engineering services, assist in the designing and construction of roads, factories, mines, and public works. We must establish banking facilities and in every way possible aid in the vast undertaking of reconstruction and rehabilitation. There are those in this country who fear such aid to our overseas neighbors lest by doing so we increase our competition in trade. They forget that the record shows our best markets have always been those countries which were most highly industrialized.

Granting, therefore, that the United States has it within its power to effect a great upsurge in its foreign commerce, where does California fit into this picture?

Probably no State in the Union stands to profit more from the post-war revival of foreign trade than does California. By virtue of its strategic location in relation to the late war in the Pacific, California became the final processing ground and assembly point for many new industries and projects born of war but which now plan to carry over into peacetime pursuits.

California is the fastest growing State in the Union both from the standpoint of population and new industries. Many of these new plants, according to reports from men in the industries, are planning their operations on the basis of 15 to 20 per cent of their output for the export trade. In other words, they will operate two months of each year to supply the requirements of their foreign customers.

Some of the items which will be processed or manufactured in California for export include frozen foods of all kinds; new types of lumber products, plastics, housing panels and plywood combinations; new types of building materials and prefabricated homes; diesel engines and farm machinery of all kinds; metal products in great variety, including household furnishings and utensils; electronic equipment, synthetic appliances for the home, machine tools, oil burners, auto-handling and repair equipment, and airplanes and accessories.

In the field of electronics alone there will be a tremendous export business from California. New plants are to be established by the General Electric Company at Anaheim and San Jose, and Westinghouse Electric Corporation is expanding its plant facilities at Emeryville. All of which indicates that we may look for the manufacture here in California of many new modern electrical appli-

ances and electronic equipment, including such items as radar, electric eye devices, automatic pilots, walkie-talkie radio phones and radio telephones for ships, planes and railroad cars, and many other war-born devices which may be applied to peace-time economy.

In the light metals field there has opened up a whole new industry with enormous foreign trade possibilities. This encompasses the wide range of household furnishings and utensils, chairs, tables, beds and a hundred kitchen and garden supply items. The new light metals industry will also fabricate numerous building materials and make bodies for buses, trucks and automobiles. This is one of the West's newest industries since the war, and one of its most promising from an export point of view.

Many new synthetic products, processed from petroleum and unheard of before the war, will shortly make their appearance and be on the list of exportable items. Two of the leading oil companies of California have carried on exhaustive research during the war and are now said to be in a position to go into mass production of numerous synthetics.

Another item which before the war was very small on California's industrial horizon but which now bulks large in her export trade potential is that of heavy machinery. Farming machinery, irrigation equipment, pumps and valves, new types of construction machinery and heavy road-building equipment, diesels for industrialization of devastated areas, are just a few of the items which will be made here in the West and shipped from California.

There is one industry in California that deserves more than passing attention. That is her food industry. Already a prolific producer of choice fruits and vegetables, much of which has been dried and canned for export, the advent of frozen food processes has given California whole new horizons of trade-development possibilities. Through the miracle of "quick-freezing" plus the perfection of refrigerated shipping space, the prime product of California truck farms and orchards, formerly available within limited areas, may now reach distant overseas markets in garden-fresh condition.

In certain industrial pursuits, California may operate at a competitive disadvantage with other sections. But in agriculture she plays second fiddle to none. Here is her greatest natural trading opportunity, both domestic and foreign. This new processing technique, known simply as "frozen foods," still an infant industry, may well prove to be the touchstone of new California wealth rivaling the golden bonanza days.

The late Arthur Brisbane used to say, "Texas under intensive cultivation could feed the world." That might have been true in theory but not in fact, because in those days there were no quick-frozen foods and no adequate system of distribution. Today, California in fact has a good chance of becoming the world's chief supplier of foods. Several steamship companies, our own included, have anticipated this great market by having specially designed refrigerated (reefer) cargo space built into their new vessels.

Earlier in this discussion I emphasized the tremendous promotion and advertising job that had been done

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on behalf of American goods through the medium of Lend-Lease. Well, there is a California industry which I want to mention here because it has done a world-wide "selling" job of American products that is even more valuable than Lend-Lease. I say "more valuable" because the California job is sustaining, year in and year out, with great cumulative value. I have reference to California's motion picture industry. American-made movies, giving visual proof of our high standards of living, have created more real desire for American-made products — automobiles, smart clothes, fine homes, washing machines and radios—than any other medium or sales force on earth. The potential of the movies in developing U. S. overseas commerce is virtually limitless.

From an industry point of view, therefore, it would appear that California is in a preferred position to profit from any revival of foreign trade. It is estimated that there are 3000 manufacturers and business houses in the San Francisco Bay Area and 4000 in the Los Angeles Area who are willing and able to develop markets abroad. Whether this desirable result actually comes to pass in the manner planned, both for California and the nation as a whole, depends upon the answer to our second question:

Is an American Merchant Marine important in developing, sustaining and protecting our international commerce? After two world wars in one generation, most Americans are now convinced that this country should maintain, as a matter of national policy, an adequate merchant marine. Most of the recent confusion, however, has arisen over the question, What constitutes an **adequate** merchant marine?

This country came out of the late war with the greatest merchant fleet in the history of the world—a total in excess of 50,000,000 deadweight tons. This represents two-thirds of all the commercial ships presently afloat.

Estimates of what the United States can use profitably in post-war foreign commerce run all the way from 4,000,000 to 5,000,000 tons, as recommended in the Harvard Report, to 7,500,000 tons, recommended by Admiral Emory S. Land, chairman of the U. S. Maritime Commission.

There are many other expert opinions on what our post-war merchant tonnage should be. However, the Merchant Marine Act of 1936, which is still hailed as the "Magna Charta" of American shipping, lays down this principle:

"It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine:

"(a) Sufficient to carry its domestic waterborne commerce and a substantial portion of the waterborne export and import foreign commerce of the United States and to provide shipping service on all routes essential for maintaining the flow of such domestic and foreign waterborne commerce at all times;

"(b) Capable of serving as a naval and military auxiliary in time of war or national emergency."

There has been confusion and disagreement also over what constitutes a "substantial portion" of our foreign commerce, as stated in paragraph (a) of the Merchant Marine Act section quoted above. This is

(Continued on page 755)

Outlook for Paint and Varnish Oils

By Allen P. Allensworth

Much ado has been made of shortages of lumber, rosin, turpentine, bricks, plumbing supplies and other building materials during the initial period of the reconversion period. Probable deficiency of paints and varnishes has been less generally publicized, although lack of adequate supplies of protective coatings would prevent occupation or sale of new houses, retard rehabilitation of habitations, ships, vehicles and finishing of countless articles requiring coatings for protection or adornment before becoming salable.

Output of paints, varnishes, linoleum and oilcloth depends, mainly, upon the supply of drying oils, such as linseed, wood, fish, dehydrated castor, perilla and oiticica. The most widely used is linseed oil. It has to carry the burden as principal vehicle in protective coatings and floor coverings. Oriental phase of the recent global conflict and Chinese internal dissension shut off supplies of wood and perilla oils. Reappearance of the former will start modestly early in 1946; may not attain volume until 1947. Marketings of perilla from Japan are uncertain; may not begin until 1947. Fish oil and dehydrated castor are minor factors, with European competition for castor beans in Brazil and O.P.A. price ceilings for castor oil here making imports of beans progressively less profitable and possible. Oiticica oil, a Brazilian product, is a new item of commerce relatively and the quantity imported is still comparatively insignificant.

Over many years the ratio of linseed oil use to the total disappearance of drying oils has been from 65 to 90 per cent. The latter was attained in the war period. In early reconversion linseed oil will continue to be the crux of the drying oils situation.

Estimated construction in this country from August 1, 1945 to August 1, 1946 is $7,000,000,000; rehabilitation $4,000,000,000, although Department of Commerce now thinks it may be $5,000,000,000. Assuming that building costs are 35% over those of the twenties, the calculated construction, valued at seven billions, would be equivalent to building of $4,500,000,000 in the twenties. Repairs of four billions would be equal

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to those valued at three billions. The average yearly value of construction awards in 37 states east of the Rockies, 1922-1929, inclusive, was $5,419,692,000, according to the F. W. Dodge Corporation. Average yearly consumption of drying oils was 906,888,000 pounds, including 724,318,000 pounds of linseed oil, or 80 per cent.

On experience of the building boom of the twenties it is reasonable to assume that in the twelve months from last August 1, beginning of the statistical year for linseed oil, this country can consume at least 1,000,000,000 pounds of drying oils. Probable supplies of drying oils in that period are:

Oil	Pounds
Wood (tung)	16,000,000*
Oiticica	18,000,000
Fish	40,000,000
Castor	40,000,000
Total	114,000,000
Linseed oil required	886,000,000
Total drying oils	1,000,000,000†

* Includes 12 to 13 million pounds of domestic oil.

† Equivalent to 46,000,000 bushels of flaxseed.

To obtain 886,000,000 pounds of linseed oil we shall require a crush of 46,000,000 bushels of flaxseed. Possible supplies of flaxseed, twelve months from August 1, 1945:

From	Bushels
United States, 1945 crop	29,000,000
Canada (Unassured)	500,000
Mexico (A hope)	500,000
Argentina, to Jan. 1, 1946	800,000
Argentina, Jan. 1, 1946-Aug. 1, 1946	5,000,000
Total, probably in sight	35,800,000
Flaxseed that could be needed	46,000,000
Deficit	10,200,000*

* Equivalent to 195,840,000 pounds of linseed oil.

Old crop carryover in Argentina on December 1, 1945, is calculated at about 5,000,000 bushels. Assuming that this offsets probable shipments of flaxseed to the United States before August 1, 1946, it may be said that by that date we will have received nothing from the new crop, available from December 1 this year. Exportable surplus may be about 34,000,000 bushels—39,000,000 at the outside—from a production of 45,000,000 bushels: 50,000,000 maximum.

Instead of the 5,000,000 bushels

Bagged linseed stacked at an Argentine country station awaiting transportation to ports.



probably to be received from the Argentine January 1, next, to August 1, 1946, we should get about 15,000,000. The 10,000,000 that we may not receive will be sent to Europe, doubtless. During the war civilian consumption of linseed and drying oils in this country fluctuated under governmental restrictions. Use fell as low as 45 per cent of the 1940-41 average in order that large quantities of domestic and imported linseed oil could be sent to our Allies—mainly Russia, where it was used for edible purposes. In 1944 alone we shipped abroad 202,000,000 pounds, mostly on the cuff. Although the war is now history we are denied the opportunity to build up stocks and obtain needed supplies of flaxseed and linseed oil vitally required by activities incident to reconversion.

This is because the distribution of Argentine flaxseed is determined by the Combined Food Board of the United States, Great Britain and Canada, although the procurement of the flaxseed and linseed oil in Argentina is done by an agency of the United States Government under the stipulations of the trade treaty between the two countries which became effective last spring. Since then Argentina has exported about 4,500,000 bushels of flaxseed, of which about 20% was allocated to the United States, 80% to the Continent and the United Kingdom. Argentina undertakes to deliver to the buyer for the United States its exportable quantity of flaxseed at the fixed price of $1.66 per bushel, f.o.b. Buenos Aires. Distribution is determined by the Combined Food Board.

It is said that this agency will last to next July, at least. It is dominated by the British representatives. Our members of the board appear to do little more at the conference than to hang up their hats and receive their orders.

The deplorable supply situation of linseed oil for the first seven months of 1946 cannot be alleviated by private initiative. Our flaxseed crushers



Loading linseed, Port of Buenos Aires.

are barred from purchasing in Argentina. That function has been reserved to itself by the United States Government. This had its inception in the lend-lease era when American dollars were laid on the line for flaxseed procurements in Argentina regardless of destination. The system now continues to prevent a bulge in prices in Argentina by reason of competition, to guarantee that the bulk of supplies shall go to Europe at the behest of British suasion and to comply with the tenets of the Argentine-American trade treaty. Our country, supposedly the foe of cartels and governmental trusts, therefore finds itself in the role of figurehead in a buying combination of governments, dictating prices and imposing regulations upon a friendly but neutral nation.

Our State Department maintains that the Argentine nation is not friendly. That attitude explains, in part, why it is so easy for the Combined Food Board to divert the bulk of Argentine flaxseed shipments to the Continent and the United Kingdom. Our diplomats seem to think that they are imposing some sort of economic sanction upon the Argentine military government, for past sins of commission and omission by holding down shipments to the United States, although it is doubtful if the Argentine authorities are interested in the ultimate destinations of their country's produce so long as it is bought and exported.

The fats and oils authorities of the Department of Agriculture are fully informed with respect to the impending shortage of flaxseed and linseed oil. The Department was largely instrumental in procuring an appropriation from the Congress which permitted payment of a bonus of $5 an acre to growers of flaxseed in 1945. From funds of Commodity Credit Corporation it has agreed to guarantee flaxseed farmers the equivalent of a price of $3.60 per bushel, Minneapolis-Duluth, for the crop to be planted next summer. As the ceiling price is $3.10 the implication is that by a method, to be announced, the difference of 50 cents per bushel will be paid by C. C. C. The Department of Agriculture would like to see larger imports of flaxseed from Argentina by next August, but neither it nor the buying agency in the Argentine, which is a component of the Department, can override the Department of State. The diplomats are more concerned with their "peeve" against Argentina and the necessities of the Continent and the United Kingdom, as depicted by the British representatives on Combined Food Board, than by the fact that the linseed oil mills of this country for the last year have been able to operate only at 50% of capacity and that the momentum of reconversion will hinge largely upon adequacy of supplies of the principal drying oil used in protective coatings.

From a carryover of 5,000,000 bushels and a new crop exportable surplus of, possibly, 34,000,000—a total of 39,000,000—the present program is for us to get 5,000,000 from Argentina by next August 1. In justice to the Department of State for permitting an allocation of 5,000,000 instead of 15,000,000, as required, it should be said that the Department maintains that a severe breakdown of Argentine transportation will prevent delivery to ports of the Argentine flaxseed exportable surplus; that

Pacific World Trade

shipments of only 5,000,000 bushels to the United States will be a greater percentage than might appear superficially in relation to supplies on December 1, actual and potential, of 39,000,000 bushels. Based upon the percentage already shipped to this country it might appear that the Department expects that only 25,000,000 bushels will reach Argentine ports from a carryover and new surplus of 39,000,000, assuming that the 20% ratio for this country will be maintained.

The paint and varnish industry, in rebuttal, asks that a larger portion of exports should be sent here; that our Eastern mills should be permitted to crush a quantity of Argentine flaxseed, in addition, the oil from which would remain here and the high protein cake would be shipped to Europe despite our urgent need of it. It is pointed out that Europe needs linseed meal and cake more than it requires linseed oil. These representations have fallen flat at Washington —outside of the Department of Agriculture.

Unless the Department of State revises its attitude, therefore, we may expect a severe shortage of linseed and drying oils next spring and summer which will have reverberations in the paint and varnish industry.

In the 12 months from August 1, 1946, it is expected that building operations may attain a value of $9,000,000,000. To meet the demands for paint, varnish, linoleum and oil cloth under such a program we might need at least 1,250,000,000 pounds of drying oils, a new high record for the country. Our crushers, with a capacity for crushing close to 59,000,000 bushels in 12 months, would like to mill at least 52,000,000 bushels to 56,000,000 to produce 1,000,000,000 to about 1,100,000,000 pounds of linseed oil.

In any one year we have never grown more than about 45,000,000 commercial bushels. This year we produced only about 29,000,000 commercial bushels even with a stimulative bonus of $5 an acre. The "goal" for 1945 was 5,000,000 acres, but only 3,863,000 were planted. If we get 4,500,000 in 1946 we may be doing very well. From such an acreage we might hope to get 34 or 35 million commercial bushels, with fine growing weather. This would leave a deficit of 18 to 21 million bushels which would have to be imported.

Therefore, to meet reconversion ideas in the 12 months from next August, one or both of two contingencies will have to be met. American farmers will have to grow more flaxseed than now appears probable and our authorities at Washington will have to permit the importation of greatly increased quantities of flaxseed from Argentina.

Washington says that it is not worrying; that Argentina should produce an immense flaxseed crop in 1946 for shipment in 1947 and that there will be enough for us. If one considers that the next Argentine flax crop will not be planted until next June-September he might regard this as the ultimate in crystal gazing.

The American Merchant Marine

(Continued from page 752)

generally accepted to mean that we should seek to carry at least 50 per cent of our overseas commerce in American flag bottoms.

With so many intangibles to deal with it is easy to understand the difficulties and the varying points of view encountered in framing the all-important Ship Sales Bill, now pending before Congress, which is designed to set the pattern and terms for disposal of our enormous surplus tonnage. It is earnestly hoped that we will not again "short-change" ourselves to the point where our foreign trade and national security will be in jeopardy.

How large should our post-war merchant fleet be? How long should a bridge be? On the theory that you should cut the cloth to fit the pattern, we should maintain a merchant marine of sufficient ships to carry at least 50 per cent of our anticipated international trade.

The absolute necessity of having our own substantial fleet of ships if we are to compete for our fair share of international commerce is pointed out by Mr. Anderson, from whose book I quoted earlier, in these words:

"If we are to build up our commerce with the nations of the world, whether we do so mainly to promote our prosperity at home or to do our part in establishing peaceful trade as an antidote for international gangsterism . . . we must have available for use a merchant marine adequate to our expanding commercial needs.

"If we trust to foreign flag vessels to carry our exports and our imports, especially where the trade of new or developing fields of foreign business is involved, we can, of course, get the job of transportation done. But it will be done without any constructive interest in the expansion of our trade. A vital link in our commercial trade will be in foreign hands whose interests may be very diverse from our own.

"If there is any one lesson to be learned from the effective way that other maritime nations . . . have in the past used their ships and their shipping organizations to foster trade and divert it into their own commercial channels, it is the lesson that we cannot afford to turn our international delivery system over lock, stock and barrel to competitor nations."

Whether some of us like it or not, we have emerged from this war the strongest maritime nation in the world. That fact imposes upon us certain obligations and responsibilities which we cannot escape. Included among these is the obligation to remain strong. And we cannot remain strong if we discard our merchant marine or too great a portion thereof. We have made that mistake twice in one generation. Let us not make it again. The maintenance of a strong American Merchant Marine will depend to a great extent upon the support which vessels of United States Registry receive from the American shipping and traveling public.

In his address to Congress October 22 last, President Truman pointed to the time factor in the late war which enabled us to build ships and armaments, and then warned, "but never again can we count on the luxury of time with which to arm ourselves. Our geographical security is now gone . . . "

This time, let us keep our American Merchant Marine—not only for defense and physical security, but as an instrument for the expansion of foreign trade and for the enrichment of the lives of all people, our own included.

Pacific World Trade

Frazar & Hansen—International Merchants

The November issue of Fortune Magazine contains a feature article entitled "Yankee Traders," which tells the story of Frazar & Co. and suggests the background of one of the firms who have made possible the foreign trade success of present-day America. Today in San Francisco the firm of Frazar & Hansen is carrying on at an ever-increasing tempo.

For over 111 years, the name of Frazar has been synonymous with international trading, for it was in the year 1834 that Captain George Frazar first sailed his ship from Boston to Canton, to barter New England's wares for Chinese silks and tea, and it was 20 years later that his son Everett founded the firm of Frazar & Company, Shanghai.

The Frazar name became widely known during the next 40 years in Eastern trade. In 1867 Everett and his brother-in-law, John Lindsley, went to Japan from Shanghai and founded the firm of Frazar & Company, Yokohama, a trading house that functioned continuously from 1867 to 1941. In 1872 Everett Frazar founded Frazar & Co., New York, and thereafter resided mostly in the United States. Upon his death in 1901 he left a flourishing business and well-established name to his son, Everett Welles Frazar, who, now in his 78th year, leaves most of the running of the business to his younger associates.



O. C. Hansen

The story of the Frazars in Japan is the story of the modern transformation of that country. The first electric light plant, phonograph, street car, Ford automobile, Curtiss airplane, Baldwin locomotive, were all introduced into that country by the Frazars, which gained for that name an enormous prestige in Japan. The secret of their tremendous success was the best of contacts both in the United States and Japan, plus an endless stream of new products to exploit.

During the more than a century of business in which they have become known throughout the world, the Frazar trading companies have weathered the gamut of calamities that can beset foreign trade—credit and transportation hazards, revolutions, depressions, wars, etc. Today they hold a unique and vital position in the field of foreign trade, for they provide an outlet for United States manufacturers who, due to lack of experience or knowledge in foreign fields, or a lack of capital to spare for foreign operations, are not in a position to handle their own direct distribution through branch offices or foreign plants.

In San Francisco, at 301 Clay Street, the firm of Frazar & Hansen is today carrying on international trading at "Full speed ahead." This company provides world-wide distribution for over 60 manufacturing concerns, which it represents as their export division. At that address, orders and inquiries are regularly received from as many as 90 different countries for technical materials, including machinery, power plants, electrical equipment, radio and electronic apparatus and automotive equipment. In turn, Frazar and Hansen have agents in virtually every country in the world. Such representation is often established after personal contact by O. C. Hansen, the managing partner, or through one of the firm's salesmen.

The personnel of Frazar & Hansen is necessarily specialized, because of the foreign aspects of the business and the involved procedure required in selling this country's products to another nation. Knowledge of credits, clearances, licenses, consular papers, and various other documents, which vary according to the country to which shipment is being made, together with foreign languages, customs and exchange rates, are all necessary, for this business is a complex and highly technical one. All this, of course, in addition to a thorough knowledge of the hundreds of

(Continued on page 778)



The San Francisco home of Frazar & Hansen at 301 Clay Street.

Engineers Reaching Abroad



W. E. Waste

A busy future for the Western construction industry, and continued high level of activity at major West Coast ports, is foreseen by management of Bechtel Brothers McCone Company, a new corporation engaged in the engineering and construction business with headquarters in San Francisco.

"We are looking forward to an aggressive future in the reconstruction of the Pacific basin, and the further expansion of the West," declares William E. Waste, president of the new company. "This will have a double effect in promoting traffic in and out of Western ports.

"First, there will be the thousands of tons of shipping required to establish new industry and rehabilitate old industry. Second, there will be the continuing business which will flow from the operation of these facilities in this country and in other countries.

"We foresee a considerable opportunity for American construction interests in the Philippines, China, Java and throughout the East Indies. In addition, there will be industrial expansion in the Middle East and in the Caribbean area," Mr. Waste declared.

"I recall that following the earthquake of 1923, hundreds of millions of feet of lumber were shipped to repair Tokyo, Yokohama and Kobe. Today the devastation is worse throughout Japan and in many other places in the now-quiet war theaters of the Pacific.

"Rebuilding this great area will be



S. D. Bechtel

K. K. Bechtel



the opportunity of the construction business, and will provide increased volume for the shipping industry, operating from San Francisco, Los Angeles, Seattle and other ports."

Mr. Waste declared that his company is offering "an engineering and construction service for industrials and Government bodies, placing special emphasis on work required by the petroleum, mining, chemical and other heavy process industries; railroads, public utilities and Government authorities in this and other countries."

Key figures in the new company include many well-known names from the wartime history of the Pacific Coast shipbuilding. The board of directors consists of S. D. Bechtel, John A. McCone, K. K. Bechtel, John L. Simpson, and W. E. Waste, president: J. P. Yates and Van W. Rosendahl, executive vice presidents; Jerome K. Doolan and V. G. Hindmarsh, vice presidents.

S. D. Bechtel has been president and then chairman of the board of California Shipbuilding Corporation at Wilmington, and vice president of Marinship Corporation at Sausalito; K. K. Bechtel has been president of Marinship and vice president of Calship; Mr. McCone has been vice president and general manager and then president of Calship and vice president of Marinship; Mr. Waste was administrative manager of Calship and is now vice president and general manager of Marinship; and Mr. Doolan has been vice president and general manager of Calship.

Executives and key personnel have been drawn from the Bechtel and Bechtel-McCone interests, extensively identified with major construction on the Pacific Coast principally, but also embracing a number of projects in Alaska, Canada, the Caribbean area, Persian Gulf area, and Philippines.

John A. McCone





Jackie Dugan, pretty Powers model, points to one of the buttons which transform the Arnot Sleeper from daytime to night time use. Illustrated is the use of a photo mural on the concealed upper, one of many surfacing materials which can be used in different decoration schemes. The Sleeper pictured here is similar to one which will be used in the sample stateroom to be erected at the Marine Exchange, San Francisco.

Ship Furniture

Passengers who will travel in American luxury liners will have an opportunity in January to see their future stateroom accommodations in a sample stateroom to be erected by Arnot and Company at the Marine Exchange of the San Francisco Chamber of Commerce.

The sample stateroom will be complete in every detail, with sleeping accommodations for four people. Modern ship furniture, manufactured by Arnot and Company, will consist of Arnot Sleepers, fireproof wardrobes and dressers forming part of a bulkhead, and other peacetime innovations for passenger comfort. The sample stateroom was laid out by Joslyn and Ryan, San Francisco Naval Architects, as an exact reproduction of a room in a super-liner now on their boards.

An artist's rendering of one section of the sample stateroom to be erected by Arnot and Company in January. This picture illustrates the possibilities for daytime comfort in a room only ten feet square.



Use of the sleeper, the guest-operated folding bed which is becoming standard equipment for most new passenger vessels, enables four persons to sleep comfortably in a room only ten feet by ten feet. Three of the sleeping surfaces fold out of sight by day and the fourth becomes a comfortable divan. Beds are opened or folded away by the passengers, who merely touch a button. Both mattresses and upholstery of the sleepers are made of a newly developed foam rubber which provides unusual comfort with a minimum of thickness.

Another company development which will be featured in the stateroom are pieces of fireproof furniture which, when stacked together, comprise a class B bulkhead. The Arnot Duo-furniture, as it is called, conserves much of the space usually taken up by "portable" furniture and also provides a two-foot-square concealed passageway at the top for pipes, wires, air-conditioning ducts and ventilating ducts. The back of each item has the same finish as the joiner bulkheads, linings and ceilings in the room.

Bulkheads, linings and ceilings in the sample stateroom are of a new design, hollow-metal type which snap together and require no screws or welding.

Other pieces of furniture as well as lighting fixtures are all newly developed and will be seen for the first time in the sample stateroom. Rugs, draperies and other items of decoration have been carefully selected from new stocks not yet available in commercial quantities. A new type of plastic wallpaper, which is fireproof and can be scrubbed without injury to colors or finish, will be used in the room.

Arnot and Company, one of the largest suppliers of ship furniture in the world, were outstanding in the shipbuilding program during the war and their products were used by most West Coast shipyards, including the Kaiser Companies, Moore Drydock, the Todd Companies, General Engineering and Drydock, Matson Navigation Company, Willamette Iron and Steel, Commercial Iron Works, Consolidated Steel Corporation, Western Pipe and Steel, Marinship, and most Eastern and Gulf shipyards.

Keep Posted

NEW EQUIPMENT AND MACHINERY FOR YARD, SHIP AND DOCK

Combustion Control

Clyde F. Williamson and Ray Sullivan of Hagan Corporation and Hall Laboratories supervise both water conditioning and combustion control aboard ships at San Francisco and Los Angeles. Much activity in both phases was seen as the war shifted its emphasis from Europe to Japan. And now that peacetime shipbuilding is just getting under way, both subjects are of paramount importance.

New ships equipped with Hagan control and placed in service during 1944 include 12 C-3 cargo ships, 12 T-2 tankers, three C-5 transports, 37 C-2 cargo ships and three Navy subtenders, in addition to 58 tankers, some for the Navy, built at Swan Island—a total of 120 ships on the West Coast. Added to these were 45 ships so equipped and turned out the previous year by the same yards.

To these were added in 1945, 46 T-2 tankers and 16 C-2 cargo vessels. These ships were built by six yards: Kaiser Company's Swan Island at Portland, Oregon; Consolidated Steel at Los Angeles; Western Pipe & Steel, Marinship, Moore Dry Dock and Bethlehem-Alameda in the San Francisco Bay area.

In Mr. Williamson's own words: "Prior to 1936, the only method of controlling air-fuel ratio on seagoing vessels was by trial and error. The operators would watch the stack and adjust oil pressure or fan speed to maintain a slight brownish haze. This was considered good enough.

"With the advent of the Maritime Commission's long-range program calling for high-speed, high-pressure turbine driven ships, this method of controlling combustion was not considered good enough. It was decided to install automatic combustion control on seagoing vessels. This was a seven-league stride toward what later proved to be of great value during wartime.

"In the intervening decade many ships have gone down to the sea equipped with Hagan control. The majority of operators who have been trained in the modern vessel's operation would no sooner think of going to sea without automatic combustion control than they would think of going to sea without the various life saving devices which have kept pace with the machinery improvements below.

"Automatic control has eliminated the human element from maintenance of the desired efficiency. At first the operators did not like this elimination of responsibility and utilization of their experience, often a rule-of-thumb experience. With the expansion of the Merchant Marine, experienced men became scarce and the 'green hands' had no background of experience. Combustion control has been invaluable to these men, who have had time to adjust themselves and become acquainted with the fireroom.

"The ability of Hagan control to maintain proper steam pressure even





Upper: Clyde F. Williamson, San Francisco manager for Hagan Corporation, whose office services vessels building or coming to port in that area.

Lower: Ray Sullivan heads the Hagan Los Angeles office, which covers both combustion control and chemical water treatment of vessels.

The Standard Oil tanker R. P. Resor, first ship ever to be equipped with automatic combustion control. Date 1936.



under adverse conditions such as bomb attacks or torpedoing has been of untold value during wartime. It has enabled the operators to increase the vessel's speed at a moment's notice without worrying about steam pressure or excessive smoking which would verify their presence to the enemy.

"This was strikingly proven by the SS ———, which was steaming along in the South Pacific recently. At 6 A.M. the captain telephoned the engineer on watch, urging utmost speed, as a submarine had been sighted on the surface preparing to shell them. In the engineer's own words: 'As soon as the captain told me about this I spun the throttle wide open, walked over to the turbine and opened up all of the remaining nozzles. This sudden demand upon the boilers did not lower the steam pressure at all. The captain then phoned down and said that this was not enough. He asked for everything. I then went behind the Hagan board and increased the steam pressure 20 pounds by adjustment on the master sender. This took less time than to tell it. The significant thing about this was no drop in steam pressure and the fireman and oiler were not aware that anything had taken place except they knew that we were increasing speed.'

"The main contribution that Hagan has brought to the marine field is simplicity, ruggedness, and the inherent safety factor of Hagan control that in case of failure of air to the furnaces, the oil is automatically shut off. This is absolutely foolproof.

"Along with this problem of combustion control there is also the importance of maintaining these boilers free from scale and corrosion. The Hagan Corporation has made a pioneering contribution in this field, as its subsidiary, Hall Laboratories, Inc., recognized as leading authorities on any problem pertaining to water conditioning of marine boilers, have established outstanding records. With the advent of high-pressure boilers it was not a question of cleaning these boilers periodically, as was the practice with low pressure boilers; the question was keeping them clean at all times, as these high pressure, high temperature boilers could not stand a paper-thin scale without loss of tubes, upsetting the vessel's schedule in peacetime, and in wartime slowing the vessel down, thereby endangering the vessel and its priceless cargo.

"It was not until 1935 that Hall System made its debut on the Pacific Coast. The first installation was on the old SS Point Lobos, then operated by Swayne and Hoyt between the Pacific Coast and Gulf ports. The vessel had lost several tubes with consequent delay in arrival, and it was decided to install Hall System to eliminate this loss of tubes. This vessel was running under a mail contract and it was of utmost importance that the schedule be adhered to. She operated on Hall System, with no tube losses for the next four years, until sold to a foreign government.

"Since this first installation Hall System has steadily expanded on the Pacific Coast until it is now used on an ever-increasing fleet of vessels numbering into the hundreds."

Chain Saw For Shipyard and Dock Use

Anticipating the continued activity in shipyards and in waterfront construction work, the Lombard Governor Corporation of Ashland, Mass., has developed a lightweight line of power chain saws utilizing a new principle of link construction.

Instead of the conventional riveted type of chain the Lombard design has a patented interlocking link feature by which replacements may be made in the field without tools in six minutes' time, when teeth are damaged by running through bolts, barbed wire or other obstructions. With conventional chains, time required for replacement is much longer.

Weighing only 42 pounds, the 24-inch air saw is claimed to be the lightest full-size two-man saw yet produced. This lightness is achieved at no sacrifice in strength and durability by utilizing modern materials developed during the war period.

Operated by a 3½-hp vane-type motor, the air model is driven from a standard 105-foot compressor. Also available is a 3-hp electric unit in 24-inch and 36-inch cutting sizes with 3-phase, 60-cycle, 220-volt, AC characteristics.

For woods operation a complete portable self-contained 5-hp gas-driven unit is available in 24-inch and 36-inch sizes. The engine has an enviable record of service, with over 150,000 supplied to the Army for use on auxiliary power plants of the famous B-17 and B-24 bombers and on General Sherman and General Grant tanks.

All sizes and models will shortly be demonstrated by leading contractors' equipment houses throughout the area.





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PACIFIC MARINE REVIEW

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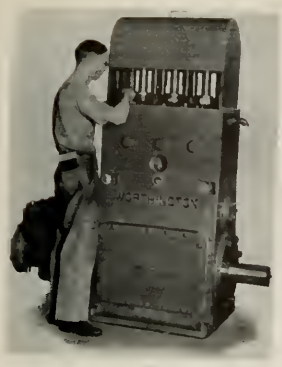
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A Variable Stroke Triplex Main Feed Pump of Simplified Design

An improved variable stroke triplex feed pump, called the Automatic Variflo, is now in production by the Worthington Pump and Machinery Corporation.

The objectives in the development of the Variflo pump have been a high pressure triplex feed pump having 0-100% capacity variation — which would afford increased dependability and easier maintenance for this vital service, together with greater compactness and reduced weight. The photograph in Fig. 1 shows a unit rated for a 75-hp driving motor. Produced as a Variflo Pump in identically the same frame as used for corresponding size of constant stroke pump, it has the same dimensions except for the control cylinder shown on the left end of the pump. This space taken by the control cylinder would be allowed as clearance space in any event. The effective space required at floor plate level by the Variflo is remarkably small, and it will be noticed that the control cylinder is at crankshaft level and comes below the floor plates in the usual installation.

The Marine Variflo feed pump has built-in single reduction helical gears permitting direct connection through flexible coupling to 1800-rpm motor. Pump and motor are assembled directly in line on a fabricated sub base forming a complete unit for easy installation on the tank top. The arrangement of the complete unit is shown in Fig. 2. Since the pump high speed shaft is located over the crankshaft, the motor location is clean, dry, accessible and well ventilated, with its center line approximately ¾′ over the bottom of the pump base.

The compactness, accessibility and pleasing appearance of this pump is accomplished by locating the crankshaft at the base, in the fully enclosed frame. Bearings are of the roller type. Positive, automatic pressure lubrication is provided by a direct driven gear oil pump. The Variflo stroke changing elements and other bearings are flooded with filtered oil at all times. The oil pump also provides oil pressure for operating the hydraulic stroke control cylinder.

As emphasized by Fig. 1, which shows an operator adjusting the stuffing box glands, the stuffing boxes are on top of the cylinder where they can be packed and adjusted without difficulty and are easily visible. Stuffing box glands are of the Worthington Patented Flange and Screw Type which are adjusted by simply turning a straight bar wrench, with no possibility of cocking. In designing this pump around the top and outside location of stuffing boxes and plungers, Worthington engineers have given recognition to the importance of plungers and stuffing boxes to a successful and reliable high pressure feed pump, gained through long experience in furnishing pumps of this style for high pressure services. Furthermore, with the outboard location of stuffing boxes any possibility of normal stuffing box leakage finding its way into the crankcase of the pump is prevented.

The complete variable stroke mechanism is self-contained in the crankshaft. It functions on the simple principle of varying the position of the eccentric to suit the desired stroke or pumping capacity. Space does not permit detailed illustration and description of the simple principle employed for the variable stroke mechanism. However, a completely descriptive bulletin is available from the manufacturer.

Automatic control is accomplished conventionally by the use of instrument air pilot pressure responsive to the water level regulator, controlling the hydraulically motivated stroke positioning piston.

The distinctive features of the Worthington Variflo main feed pump which will be of particular interest to marine engineers and designers in affording a most efficient and dependable 0-100% variable capacity main feed pump, while substantially increasing compactness and reducing weight, are summarized below.

Advantages of Worthington Automatic Variflow Power Pumps

(1) Stepless capacity variation from 0% to 100% accomplished with a simple, compact and proved mechanism.

(2) High efficiency over full range of capacity and pressure.

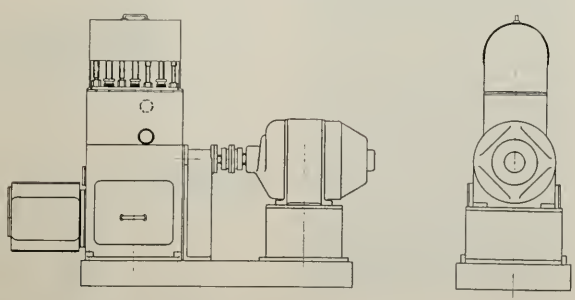
(3) A standard constant speed motor or turbine may be used for driving, with resulting over-all economy in power consumption.

(4) The Variflo pump is stuitable for all free flowing liquids.

(5) Drive shaft and stroke changing elements are a self-contained assembly, with all parts pressure lubricated.

(6) Lubrication is fully automatic with splash and pressure system to all bearings.

(7) The stuffing boxes are on top of the cylinder in their most accessible location—making routine attention easy. Crank shaft is at the bottom, engine style, resulting in loads



being transmitted and supported close to the supporting structure. Running parts are fully enclosed.

(8) Full accessibility to plungers, valves and running parts simplifies operation and maintenance.

(9) Variflo pumps have the Worthington patented flange and screw type stuffing box gland. This gland tightens up evenly on the packing and the gland cannot become cocked when adjustment is made. This means increased life of plungers and packing.

New Impermeable Plastic Coating Developed For Use in Marine Trade

Corrosite, a new and practically impermeable air-drying film, completely resistant to most acids, all alkalies, and many chemicals, has recently been developed by Baker Synthetics, Inc. The new coating—a combined thermoplastic and thermosetting film—is expected to prove of great value to the marine trade for steel decks, ships' bottoms, shafts or other surfaces requiring protection.

The advantages of Corrosite over conventional coatings are, first, that it will bond to practically any clean surface, including old paint. Second, it is claimed to offer greater abrasion resistance than can be achieved with any other material without the use of heat. It takes a sharp knife to scratch it. Third, it is electrolytically impervious: a three-coat application on shafts will completely eliminate deterioration caused by electrolytic corrosion.

Harry F. Baker
President, Baker Synthetics, Inc.



Less Weight

Corrosite clear, per gallon, weighs only 9.0 pounds as compared with 18.7 pounds for bottom paint and/or 12.0 pounds for deck paint, and covers up to 450 sq. ft. Thus, substantial weight reductions are obtained. Moreover, successive coats can be applied with only one hour's drying time between them, permitting a three-coat application in a single day and eliminating the necessity of moving rigging.

The smoothness of a Corrosite film compares favorably with porcelain. No prime or intermediate coats are required, and, prior to application, no special or unusual surface preparation is needed.

Corrosite will not crack, chip or lift, and will withstand temperatures up to 250° F. Applied exactly like paint, it will, coat for coat, long outlast any other air-drying film now in use, it is claimed. Currently available in black, clear, aluminum and gray, it is shipped in five-gallon cans and 55-gallon drums.

Veteran in Field

Corrosite was developed by Henry F. Baker, who first became interested in chemically stable, non-oxidizing coatings back in 1934, when he became general sales manager for Feroleum Products, Inc. Eight years later, when it became possible to handle plastics in solution like ordinary paint, Mr. Baker became sales manager of the Cordo Chemical Co. of Norwalk. Convinced that improvements in the bondability of plastic films could be brought about by more intensive research on synthetic adhesives, he instigated a series of experiments which resulted in the discovery of Corrosite. Research and production facilities are now set up in Ravenna, Ohio.

Improved Marine Hoist Drive Operates From A.C. Circuits, Makes Possible All A.C. Ship Operation

That the modern cargo carrier will be an all-alternating-current ship is suggested with the announcement by Reliance Electric & Engineering Company, Cleveland, of the successful development of an adjustable-speed power unit, operating from A.C. circuits, for cargo hoist, cranes, and warping capstans.

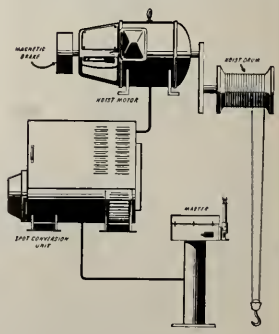
The desirability of alternating current for ship power systems has for some time been recognized, by reason of significant economies in cost of equipment and operation of such a system, as contrasted with the conventional application of direct current.

The cost of A.C. generating equipment, for example, is less than that of D.C. equipment of equivalent kilowatt capacity. Similarly, a 440 volt, 3 phase A.C. transmission system requires considerably less copper than a 250 volt direct current system. Further, the use of A.C. power makes possible the application of rugged, economical squirrel-cage motors to constant-speed auxiliaries such as fans, pumps, etc.

A stumbling block to the all-A.C. ship has been the problem of successful winch operation. D.C. motor characteristics suit themselves ideally to winch requirements of ad-



A-c. ADJUSTABLE-SPEED ELECTRICAL DRIVE FOR CRANE AND HOIST



justable speed, high starting torque, alternate high load—light load operation, and wide speed range. Not so with A.C. motors.

This formidable problem has thus far been attacked from the point of view of designing an A.C. motor which would approach the performance of the D.C. constant-potential series crane motor. A certain amount of success is indicated in the use of a specially built two-speed slip-ring motor with necessary control, although such an arrangement does not quite come up to D.C. motor performance.

Reliance engineers, with a broad background of experience in the industrial application of the Reliance V*S drive system (an economically packaged, all-electric, adjustable speed drive) approached the problem with a view to developing a similar "spot-conversion" unit for shipboard, which would convert from A.C. to D.C. at the point of application to a D.C. hoist motor.

The design arrived at is a simple, integrated system consisting of power unit, D.C. motor and controls, which gives performance better than the conventional D.C. equipment.

As illustrated, the power unit consists of a motor generator set and exciter, plus controls for the system. The D.C. motor is a special compound motor having a shunt field to limit speed for light load, and having a second winding which gives the effect of series or compound characteristics in order to carry a heavy load at low speed.

The spot conversion unit can be placed in the deckhouse, below deck, or in an enclosure above deck built possibly as a part of the cargo hoist itself. Over-all space requirements are no greater than those of a conventional D.C. hoist, and less than required by an improved A.C. hoist.

In operation, five speed points for hoisting and five points for lowering are provided with simple control involving only field contactors and interlocking relays. More speed points can be supplied as needed.

Another advantage of the system is that power is actually pumped back into the power line when lowering a load. Such operation indicates, on the average, a saving of 50% over the conventional D.C. system, and about 70% over the two-speed A.C. slip-ring special motor and control.

Although certain built-in safety provisions have been designed in the system, many more are provided inherently by the system itself. Safety features protect against phase failure, phase reversal, power failure, brake failure, field failure, and overload (both A.C. and D.C.)

Maintenance of the new system promises to be a fairly simple matter. Since the control is only handling circuits of small current values, considerably less maintenance will be required than would be normally necessary on contactors handling heavier armature current. In addition, a great deal of the stopping is accomplished electrically, thereby requiring the magnetic brake only to act essentially as a holding brake and not a stopping brake.

Finally, there is considerably less heat generated as losses, since there are no heavy current-carrying resistors in the circuit, as is the case on a conventional series motor crane hoist.

Circular Camel of Laminated Wood Designed to Prevent Damage to Ships

A new type, cylindrical "camel" of laminated oak, used to prevent damage to ships while lading, has been produced by Gamble Brothers, Inc., Louisville, and application for patent filed.

The principle of the new camel is a series of split rings of laminated oak, joined by strakes of the same material in such a manner that it absorbs not only compressive action but also longitudinal rack.

Cylindrical camel of laminated oak, used to protect ships from damage while lading.



The largest model produced by Gamble Brothers is 26 feet long by an over-all diameter of about six feet, two inches. It consists of 24 rings, nine inches wide by 5½ inches deep, and having an outside diameter of five feet. These rings are built up of quarter-inch laminae. A split of 4½ inches provides the shock absorber against compressive action. The number of pounds pressure required to close this gap can be accurately predetermined. The bottom is counterweighted to float the split uppermost.

The rings, spaced 3½ inches apart, are joined by 16 longitudinal strakes fastened by three-quarter-inch bolts to alternate rings. This method of fastening permits play which absorbs longitudinal rack. Teco Timber Connectors are used in the two strakes adjacent to the split, because that is the point of greatest strain. The strakes are about 6x6 inches, built up of three-quarter-inch laminae.

Undersea Cameras

Special water- and pressure-proof cameras and equipment developed by Photo Utilities, Inc., in cooperation with others in the photographic industry, including Graflex, Inc., for the Navy Bureau of Ordnance, furnished America and her Allies with the world's finest underwater intelligence service. This new equipment is expected to have important applications in peacetime salvage operations.

Faced by the overwhelming problem of determining accurate damage to American warships crippled and destroyed at Pearl Harbor, the Navy found existing underwater photographic equipment and techniques impractical in the extreme depths and dirty water in which they were forced to work. Sketches made by divers from personal exploration took precious time and lacked the extreme accuracy and detail required for salvage work.

Utilizing the automatic motor and film transport mechanism of the K-25 aircraft camera manufactured by Graflex, Inc., the 90mm. wide angle Graflex Optar lens in Graphex synchronized shutter originally designed for Speed Graphic press cameras, and a special aluminum pressure case, with pressure type controls for lens, diaphragm and shutter, the engineers

of Photo Utilities, Inc., developed an electrically-operated multiple exposure camera capable of withstanding pressures at depths as great as 225 feet. Using only standard film, filters and flashbulbs, the camera can be operated from the surface by remote control, yet is sufficiently compact to be carried and operated by a single diver.

Flashbulbs Used Under Water

Because of the extreme murkiness of choppy waters and great depths, most underseas photographic work requires from one to four standard size flash bulbs. Special waterproof socket reflectors developed by the Mines Equipment Company prevent the danger of short circuits and make it possible to change bulbs under water. In crystal clear areas of the Pacific, however, standard snapshot exposures are possible at depths as great as 100 feet.

Extreme depth of field and focusing from 2 feet to infinity are possible with a specially adopted helical mount which moves the film toward and away from the lens instead of the opposite standard procedure.

A dome-shaped aluminum pressure case protects the camera from damage by water or pressure. For the first time in underseas equipment, the curved protecting glass over the lens forms an integral part of the optical system, providing critical definition under all conditions. Special waterproof compartments within the camera prevent total damage in case of accident to one or more sections.

Important peacetime uses are foreseen for this underseas camera which will add speed and safety to the formerly perilous divers' surveys required in salvage operations. Ichthyologists, cartographers, cable companies and other deep sea workers will undoubtedly find many new important uses for the equipment.

Diesel Engine Pressure Indicator

The Bacharach Industrial Instrument Company is now producing the simplified Premax Model YRF engine pressure indicator for direct reading of compression and firing pressures of any type of diesel engine at any engine speed or rate of pressure rise. The instrument is designed so that the counter locks automatically when the maximum pressure in the cylinder shows on the dial. This unique feature makes it practically impossible



to make a mistake in reading. Another important practical feature is that only one figure appears in the window of the counter, and this figure represents the actual maximum engine pressure, in pounds per square inch.

Successive pressure readings may be taken rapidly with the indicator, since no venting is required between readings. According to its manufacturer, the precise factory calibration of the instrument is permanent even if it is exposed to over-pressure, shock, or exceptionally severe usage. In a recent test it is reported that it was kept on an engine to check firing pressure approximattely 500 times within eight hours, yet at the end of the test the calibration was found to be practically unchanged.

The indicator may be used to indicate cylinder pressure up to 1700 psi. No adjustments or settings of any kind are required in the field to compensate for instrument characteristics, purpose of test, or engine conditions.

Increasing Evaporator Efficiency

Evaporator output is increased by as much as 50 per cent by the use of Piezo D-Scaler. Ship engineers who have tried this product report efficiency averaging as high as 80 per cent of clean tube rating.

This material is a penetrating agent which greatly assists the thermal shocking method of removing scale. It is a chemical in powder form, used simply by mixing with water and pouring into the evaporator at any connection. Besides de-scaling, this chemical actually assists in the prevention of formation of scale. As a scale preventive, the manufacturer recommends that it be used monthly or bi-monthly, depending upon the rapidity of scale formation. D-Scaler has eliminated the need for manual cleaning of evaporators.

D-Scaler was developed by the Piezo Manufacturing Corporation, New York, during the war for use on ships directly aiding in the war effort. It was used on ship runs where scale formation was particularly severe.

Pneumatic Air-Speed Saw

The new Air-Speed saw and filing tool driven by compressed air is ready for national distribution, according to the Air-Speed Tool Company, distributor, Los Angeles, California.

Designed to simplify and speed-up most sawing and filing operations, the Air-Speed tool can be worked advantageously in awkward or cramped quarters or from difficult positions. An adjustable barrel readily permits circular sawing in metals or woods, as well as difficult "dead end," keyhole or scroll work. Perfectly balanced for ease of handling, and weighing only 3½ pounds complete, the new tool features fingertip speed and power control, and a simple cutting stroke adjustment of from ¼" to 1¼".

No gears, adaptors or power take-off devices are used in the construction of the Air-Speed saw, and since only two internal operating parts are movable, long, reliable, trouble-free service is assured.



Underwater Welding Photographed

The practicability of welding and cutting under water has been proved successful by a number of recent applications, such as salvage work on damaged war vessels. However, such work has literally been "done in the dark," as no one except the diver or a companion has been able to see the actual operation of this modern technical development of the arc welding process. Now, for the first time, so far as known, underwater welding has been successfully pictured.

Shown in the upper dramatic view, R. L. E. Cook, welding engineer for Armco International Corporation, and representing The Lincoln Electric Company, Cleveland, Ohio, is clearly seen arc welding under 15 feet of water. The welding is being done with a mild steel electrode having a special coating that is impervious to water.

The photo was taken through a porthole in the specially designed tank used for training welders in underwater welding and cutting operations in the Mechanical Division of The Panama Canal Zone.

In the lower view, Mr. Cook is shown holding a test plate of sample weldments made under water. Shown from left to right are W. Badders, master diver and one of the principal figures in the rescue of crew members of the submarine Squalus; R. L. E. Cook, welder-diver shown in the top photo; Captain W. A. Swanson; and J. R. Morgan. G. E. Fleager in diving gear is seen partially submerged at lower right. All except Mr. Cook are employed in the Mechanical Division of The Panama Canal Zone Authority.





San Diego Tuna Clippers

(Continued from page 722)

this should be a very satisfactory ship to work and as good a money-maker as his famous Lusitania, now at sea on her second voyage after conversion to a raised deck brine boat.

New Steel Boat

The first all welded steel vessel to be built in San Diego for a number of years is Don Byrd's 52-foot baby clipper Juana. Built by the rapidly growing steel shipbuilding yard of the National Iron Works at San Diego, known as Yard No. 2 to distinguish it from the structural steel plant of the National Iron Works located on Harbor Drive near the foot of 5th Avenue, the Juana was constructed in sections at the No. 1 yard and after welding together was hauled by truck to the new No. 2 yard for completion. This little ship has a beam of 15 feet and a molded depth of 7′ 8″.

Her frames are 3/16″ x 3″ flat bars spaced on 18″ centers. Floors are 3/16″ plate 20″ deep at the keel and located on all frames. In the way of the engine room the floors are increased to ¼″ plate. There are three full watertight bulkheads of steel, forepeak, after engine room and after peak; and a double bottom is laid on the floors the full length of the hold. Decking is 3/16″ plate with 3/16″ x 3″ beams in the hold space and ¼″ x 3″ and ¼″ x 6″ beams in the engine room.

The fish hold is insulated with 4″ of fireproofed cork covered with ½″ of waterproof plywood.

The main engine is a 6-cylinder 120-hp high speed Gray marine driving a 38″ x 28″ three-blade bronze propeller through a 3 to 1 reduction gear. Auxiliary power is supplied by a 2-cylinder 40-hp Gray marine driving a line shaft. There is a power take-off at the forward end of the main engine also driving the line shaft.

The line shaft drives a 32-volt ¾-kw direct current generator, a 4-cylinder Baker 3″ x 3″ ammonia compressor for fish hold refrigeration, one 4″ centrifugal bait pump, two 2″ centrifugal bilge and deck wash pumps, a ¾″ fuel oil transfer pump and the windlass on deck forward. Engine room ventilation is supplied by an electric blower.

Four thousand gallons of fuel oil are carried in the fore peak, double bottom and after peak tanks, and at an estimated consumption of 5 gallons will give the little vessel a 6000-mile range at an 8-mile cruising speed.

The plywood main deck house is arranged with wheel house forward, 6 berths for the crew and galley and messroom aft containing an "Ingle" fuel oil range.

This handy boat is owned solely by Don L. Byrd of La Mesa, California, and takes the place of the luckless American Pilot, lost in Magdalena Bay in 1944.

Admiralty Decisions

(Continued from page 739)

and cure for the time following his discharge from the Marine Hospital which, of course, is the time following discharge with the notation "no further hospitalization necessary." The shipowner naturally contended that the plaintiff's action in obtaining a discharge from the Marine Hospital on his own request precluded recovery for any additional period. The court, however, stated in effect that it is incumbent upon the shipowner to show that further hospital treatment would not have benefited the plaintiff seaman at the particular time, and that, therefore, the contention that the mere act of leaving deprived the seaman of all further acts of maintenance and cure could not successfully be urged to defeat the claim.

This case should put all on guard against accepting at face value the statements appearing upon the ordinary certificate of discharge from a Marine Hospital. It is incumbent upon the representative to determine by a direct contact with the Marine Hospital whether or not the certificate of discharge represents a discharge by the seaman at his own request, as in this case, or a discharge by the hospital because no further treatment is possible, although the seaman is not able to return to work, or, on the other hand, whether the discharge slip represents a true and complete discharge and means the seaman is fit for immediate work.



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Reemployment Rights for Members of the Merchant Marine and the United States Maritime Service

Part III

Issuance of Certificate

Any seaman who serves a period of substantially continuous service in the merchant marine as defined herein shall be entitled to a certificate to that effect from the Administrator, in the form annexed, such certificate to contain a record of any special proficiency or merit obtained, including endorsements on the certificate of any awards (excluding the merchant seaman insignia) that may have been issued to such seaman by the Seamen's Service Awards Committee of the War Shipping Administration, or the Medal Awards Committee of the United States Maritime Commission.

Application for Certificates

If at the time of application for a Certificate of substantially continuous service in the merchant marine, the applicant has most recently been engaged as an enrollee in the United States Maritime Service as a Cadet-Midshipman or as an enrollee or student in any school or institution as defined herein, application therefor shall be made through the Training Organization. Application for such certificates by all other seamen shall be made through the Recruitment and Manning Organization. Application forms shall be provided at all regional and port offices of the Recruitment and Manning Organization in the United States, at all schools or institutions under the jurisdiction or supervision of the Administrator, and at other accessible places.

Date of Application

All applications must be submitted within the six-month period immediately following the termination of the unlimited national emergency declared by the President on May 27, 1941, except that (a) in the case of any seaman who is permanently disabled for further service in the merchant marine as the result of illness or injury not caused by his own wilful misconduct, an application must be submitted within 30 days after the expiration of a reasonable time for medical treatment and recuperation, depending upon the nature of the illness or injury, or within 30 days after the publication of these regulations, whichever may be later, and (b) in the case of any seaman as to whom the Recruitment and Manning Organization or the Training Or-

(COPY OF CERTIFICATE)
WAR SHIPPING ADMINISTRATION
WASHINGTON, D. C.
CERTIFICATE
Issued Pursuant to Public Law 87,
78th Congress

THIS IS TO CERTIFY THAT..... has on this date completed a period of substantially continuous service in the Merchant Marine, commencing on..... within the meaning of Public Law 87, Seventy-eighth Congress (57 Stat. 162), and the Rules and Regulations issued pursuant thereto by the Administrator, War Shipping Administration. This certificate is issued for the purpose of establishing reemployment rights under said Public Law.

ATTEST:

A. J. WILLIAMS, Secretary,
WAR SHIPPING ADMINISTRATION.

EMORY S. LAND, Administrator,
WAR SHIPPING ADMINISTRATION.

WSA Form No. 77—Merchant Marine Reemployment
MERCHANT MARINE REEMPLOYMENT RIGHTS
APPLICATION FORM

W.S.A. FORM NO. 77 A NO.....

APPLICATION FOR CERTIFICATE UNDER PUBLIC LAW 87
To Establish Reemployment Rights Provided in Public Law 87, 78th Congress, For Persons Who Have Left Other Employment For Service in the Merchant Marine

1. (Print)..... ....
Last Name First Name Middle Name or Initial

Mailing Address

....
Street No. Street City or Town State

Date of Birth Z Number Continuous Discharge Book No. Local Draft Board Number City or Town State

....
Month Day Year

2. SERVICE ABOARD A VESSEL

Employment Began Year	Month	Day	Employment Ended Year	Month	Day	Name of Vessel	Rating	DO NOT USE THIS SPACE

3. Service as enrollee or student in the U. S. Maritime Service, Merchant Marine Cadet Corps, or school or institution under the jurisdiction and supervision of the War Shipping Administration.

Service Began Year	Month	Day	Service Ended Year	Month	Day	Name of School or Station	Duty or Course

4. Periods during which applicant was disabled for active employment in the Merchant Marine due to illness or injury not caused by his own wilful misconduct.

Period Began Year	Month	Day	Period Ended Year	Month	Day	Nature of Disability and Where and By Whom Treated

5. Periods during which applicant awaited repatriation following separation from a vessel for any cause not due to his own wilful misconduct not including delay resulting from his refusal to be repatriated.

Period Began Year	Month	Day	Period Ended Year	Month	Day	Describe Circumstances, Giving Names of Ships and Ports

6. I hereby make application for a certificate of completion of a period of continuous service in the Merchant Marine, and I certify that the periods and nature of my service as stated in this application are true and correct to the best of my knowledge and belief.

Date ..... Signature of Applicant

ganization finds that, through no fault of his own, his continued service in the merchant marine is no longer desirable or necessary, an application must be submitted within 30 days after the date of his release or within 30 days after the date of the publication of these regulations, whichever may be later.

Sec. 2. (a) In the case of any such person who, in order to perform service in the Merchant Marine, has left or leaves a position, other than a temporary position, in the employ of any employer and who (1) receives such certificate, (2) is still qualified to perform the duties of such position, and (3) makes application for reemployment within forty days after completion of such service –

(A) If such position was in the employ of the United States Government, its territories or possessions, or the District of Columbia, such person shall be restored to such position or to a position of like seniority, status, and pay;

(B) If such position was in the employ of a private employer, such employer shall restore such person to such position or to a position of like seniority, status, and pay unless the employer's circumstances have so changed as to make it impossible or unreasonable to do so;

(C) If such position was in the employ of any state or political subdivision thereof, it is hereby declared to be the sense of the Congress that such person should be restored to such position or to a position of like seniority, status, and pay.

(b) Any person who is restored to a position in accordance with the provisions of paragraph (A) or (B) of subsection (a) shall be considered as having been on furlough or leave of absence during his period of service, shall be so restored without loss of seniority, shall be entitled to participate in insurance or other benefits offered by the employer pursuant to established rules and practices relating to employees on furlough or leave of absence in effect with the employer at the time such person entered such service, and shall not be discharged from such position without reasonable cause within one year after such restoration.

Sec. 3. In case any private employer fails or refuses to comply with the provisions of Section 2, the District Court of the United States for the district in which such private employer maintains a place of business shall have power, upon the filing of a motion, petition, or other appropriate pleading by the person entitled to the benefits of such provisions, to specifically require such employer to comply with such provisions, and, as an incident thereto, to compensate such person for any loss of wages or benefits suffered by reason of such employer's unlawful action. The court shall order a speedy hearing in any such case and shall advance it on the calendar. Upon application to the United States District Attorney or comparable official for the district in which such private employer maintains a place of business, by any person claiming to be entitled to the benefits of such provisions, such United States District Attorney or official, if reasonably satisfied that the person so applying is entitled to such benefits, shall appear and act as attorney for such person in the amicable adjustment of the claim or in the filing of any motion, petition, or other appropriate pleading and the prosecution thereof to specifically require such employer to comply with such provisions: **Provided,** That no fees or court costs shall be taxed against the person so applying for such benefits.

(Continued on page 770)



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questians—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisca 11, Califarnia

Installation and Adjustment of Brushes

Proper and correct installation and adjustment of brushes on commutators is of vital importance. In diagnosing bad commutation careful inspection of the brush adjustment is one of the important parts of the procedure. It is to be noted that mechanical and electrical symmetry of the generator or motor on which brushes are used is also essential to the satisfactory performance.

Three types of brushholders will be found in marine practice—the box type, the reaction type, and the double brushholder. Reaction type holders are so mounted as to hold the brush at a considerable inclination from the radial. That is, the center line of the brush may make an angle of as much as 35 to 37 deg. from the radial line of the armature. This means that the active brush face has about the same angle to the flat edge of the brush. The upper or top face of the brush will also then have an angle of about 30 deg. and possibly have a metal clip which may overhang the side of the brush. The pressure arm of the brushholder rests on this metal clip and the centers possibly out near the end of the metal clip. This type of brushholder may only be used in machines having one direction of rotation, and that must be such that the surface of the commutator travels against the angle of the brush. This action, sometimes called stubbing or leading action, is used in contradistinction to the term trailing action, where the surface of the commutator is dragged along underneath the brush. It is to be noted, then, that leading brush action is effected by the friction of the commutator on the brush by tending to push the brush away from the commutator. Trailing action, on the other hand tends to pull the brush down to the commutator, due to friction; thus if a brush is at an angle of 37 deg. and operating trailing, it would tend to wedge or jam in the box, and would not operate satisfactorily. Therefore trailing action of brushes is seldom found with an angle exceeding 15 deg. to the radial.

The combination of forces of the pressure arm on top of the sloping head of the brush, combined with the commutator at the steep angle of 35 deg., both tend to force the brush back against a surface of the brushholder where it rides steadily and needs no other support on the other side or edges except bands or narrow strips, and close clearance between the brush and the side or guide strips is unimportant. The trueness of the surface against which the back side of the brush rides is the only important factor.

With the box type of brushholder, an angle of 15 deg. is quite customary and the brush supported on both sides and both edges, permitting the machine to be in either direction of rotation. In other words, this angle of 15 deg. permits the brush to be run either leading or trailing in action, provided that there is a close clearance between the brush and the holder on all sides and edges.

The clearance of the brush is determined by the accuracy with which it is cut and of machining the brush box. Brush thickness is normally held between the limits of exact nominal size and .004" under. Variations in the corresponding dimensions of the box should not exceed .003". Taking both variations into consideration, a minimum clearance of .002" and a maximum clearance of .009" should be found on properly dimensioned brushes and brush boxes. Excessive clearance between the brush and holder allows the brush to tip and disturbs the contact with the commutator. This is especially true with machines which have reversing action, such as the deck winch and anchor hoist motors. Excessive side wear on the brush or the box increases this clearance and may eventually be a source of trouble.

The double brushholder uses two brushes in the axial space of only one. These two brushes are slightly thinner than normal so that the sum of their thickness might be considered the total brush thickness. One brush operates on leading action to the commutator, the other operates on lagging or trailing action. Their angles are such that when they ride on the commutator they are quite close together with only perhaps a 1/16 to 1/8" separating them on the commutator surface. There are many advantages to this type of brushholder, and it is found extensively where heavy duty and shock loads are to be found. The angles of the two brushes in one holder to the radial lines are not the same, and are selected based on much experience with these machines. Where the machine runs in one direction only or principally in one direction, these angles may be noticeably different, but nevertheless the action is still leading for one and training for the other.

All brushes used in marine service have a copper pigtail or flexible copper shunt connecting the brush to the brushholder so as to minimize the amount of current carried by direct contact, which may cause excessive wear, particularly on the brush, due to very small sparks. In adjusting brushes it is very important to note that this braided or twisted flexible copper shunt connected to the brush makes good firm contact to the brush material, as if

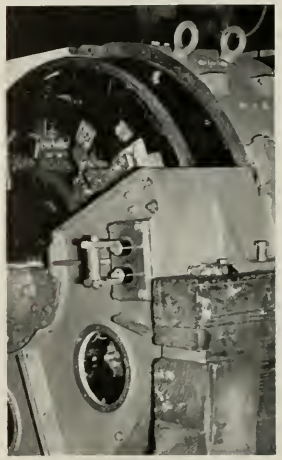
this connection is loose or poorly made the brush will not carry its share of the current in parallel with other brushes. This may overload the others and the diagnosis of the trouble may be extremely difficult, as the trouble appears on the good brushes, whereas the brush with the defect appears to be operating nicely. The unequal distribution of current amongst the several brushes on one brush stud sometimes is called selective commutation. Some brush materials have what is called a negative temperature coefficient of resistance. Most materials increase their electrical resistance with increases in temperature. Some materials and some types of carbon have the reverse action, namely, that increase in temperature causes a decrease in electrical resistance. Note that if brushes are used having this negative coefficient of resistance, when a brush tries to carry more current than its neighbors in parallel it will get warmer, which will lower its resistance. This causes it to carry even more current, until finally the one brush is carrying all the current of the stud and it may get very hot, even to the point of becoming red hot. Although this does not occur to any great extent on modern machines, there have been many cases on record where one brush carries all of the current in the stud and becomes red hot. This, of course, may damage the commutator.

In adjusting the brushholders to the machine, it is also important to have the clearance between the brush box and the commutator surface reduced to about 1/8 to 3/16 of an inch. Many marine electricians do not appreciate the importance of this point, and on their ships brushholders will be found running 1/4 to 3/4 of an inch away from the commutator surface. This changes the angle of contact of the brush to the commutator, as well as the combination of forces, and also reduces the amount of brush wear available, and has many other negative effects.

Maintenance of firm contact between brush and face of commutator is essential to satisfactory performance. While intimacy of contact is affected by the characteristics of the brush material, it is also dependent upon several factors directly associated with the manner in which the brush is held against the commutator. To secure firm contact of the brush space from side to side, from edge to edge, brushholders must be securely mounted and the action of the pressure finger must be symmetrical and must be free from side thrust towards either edge. Furthermore, the brush must have freedom of movement in the direction of the swing so that it can easily follow minor irregularities of the commutator surface.

Brush Spacing

Accurate spacing of brushes around the commutator is a factor of major importance in obtaining good performance. Non-uniform spacing causes circulating current to flow between brush studs of like polarity due to the difference in potential. These circulating currents may be high enough to cause serious heating of the armature windings and excessive current density in the brushes and may give rise to some selective action also. Furthermore, it is possible under such conditions to adjust all brushes to the best commutating position.



Brush holders and brushes on a marine generator.

A convenient way to check the spacing after installing the brushes in the holders is to stretch a strip of paper around the commutator underneath the brushes and mark it with a sharp pencil at the toe of each brush, identifying the marks in some manner with several brush studs. If measurements show these marks to be unevenly spaced, the brushholder supports should be adjusted to correct this condition. The method by which this is done will depend upon the mechanical construction of the brush studs supporting elements of the machine. Even spacing of the brushes should not be accomplished by rocking the brushholders on the supporting studs, as this is liable to leave some of the holders further from the commutator surface than is desirable.

On machines with series or wave wound armatures such as will be found on most of the deck winch and anchor hoist motors, only two brush studs will be found, even though the motor may be more than two pole. The brushes are, therefore, not spaced equally around the commutator as indicated above, but are spaced exactly one pole pitch apart. Nevertheless, the correct spacing from toe to toe of the brushes is important. This can be accomplished by accurately measuring the circumference of the commutator and dividing that measurement by the number of poles and adjusting the distance between the brushes to the value so determined. It may be found on machines of this type that it is impossible to move or adjust the angular distance between brush studs, but fortunately it is quite unlikely that improper spacing will be found.

Another important factor is the alignment of brushes with the commutator bar. This can be determined by observation. By placing the commutator in such a position that the toes of the brush next to the armature just align themselves with the slot of the commutator then all of the other brushes on the same stud should also align with this slot. If they do not, some adjustment should be attempted. This adjustment may be quite difficult as there may be no evident method of such alignment. Sometimes the insulating supports for the studs may have to be removed and trimmed or assembled in another position to accomplish an alignment. Lack of this alignment increases the over-all span of the brushes and prolongs the commutation interval, and may make it difficult to find a position at which the brushes will operate without sparking. Also, the brushes farthest out of line may be forced to take the brunt of commutation and be subjected to destructive sparking not occurring on the other brushes. While it is possible, it is quite unlikely that the as-

sembly of the commutator bars on the commutator supporting spider may be slightly askew.

Of equal importance, of course, is the assembly of the machine itself so that the spacing of the field poles is exactly uniform. Non-uniformity here has the same effect as this same trouble with the brush studs; also this condition may be more difficult to correct. If it is impossible to move the field poles with respect to the magnetic frame, it may be necessary to cut off the tips of the pole face shoes on those poles which are less than the correct distance apart, or make other mechanical changes to bring the machine assembly into a perfectly symmetrical condition.

In checking brush assembly and adjustment, another factor in which trouble shows itself at the brushes, but involving machine assembly, should also be checked. The air gap or mechanical clearance between the armature and the field pole should be symmetrical and equalized if at all possible. Equalizing this air gap may be very difficult, as it might mean moving the bearings or frame structure. Many machine designs eliminate altogether this possibility. Machines, however, having pedestal bearings can be adjusted to centralize the armature by shimming the pedestal bearings and moving horizontally and redrilling for dowel pins. Unequal air gaps may be caused by loose pole pieces also, or improper adjustment of the steel frame. Worn bearings also contribute to this condition. Commutation trouble and heating of the armature windings are some of the disturbing elements resulting from unequal air gaps. The unbalance of the air gap results in an unbalance of the magnetic circuit and, therefore, a lack of the uniformity of the magnetic flux in the air gap under the different poles. Lack of magnetic symmetry or equality produces inequality of potential or voltage generated in the coils as they pass under succeeding pole pieces. This inequality of voltage causes circulating current to flow through the armature coils and through the brushes and studs of like polarity. These currents may be very high, even at no load, and are augmented under load conditions by unequal distribution of load current.

Equalizing Connections

To prevent this unequal current in the studs of like polarity due to unbalanced air gap or other non-uniform or non-symmetrical conditions of the machine, equalizing connections are installed in the armature winding to provide a low resistance path between commutator bars which will always be at like polarity. If all bars of the commutator which are likely to be under the positive brushes at any given moment were tied together with a copper connection, the armature is said to be 100% equalized. Only on large machines is this done. On the smaller machines, every other bar or every 3d, 4th, 5th or 6th bar may be equalized. Inasmuch as the brush studs are connected together externally, when of like polarity, and if connected together by equalizer bars inside the armature, this means that the brushes will carry about the same current even though unequal voltages are generated in the coils corresponding to the bars. Circulating currents flowing in the armature resulting from unequal air gaps produce demagnetizing effects in such a direction that they tend partially to restore the symmetry of the magnetic field structure. This, however, is only partially corrective.

With the series or wave winding having only two paths in parallel and only two brush studs for the 4 or 6 pole machines, the coils may be considered in series, and inequality of the magnetic flux path does not produce unbalanced current in the brushes. This, then, applies to the usual deck winch and anchor winch motors.

Our next article will discuss brush staggering and brush seating.

Steady as You Go!

(Continued from page 767)

Sec. 4. Employees of the United States Government, its territories or possessions, or the District of Columbia (including employees of any corporation created under authority of an act of Congress which is either wholly controlled or wholly owned by the United States Government, or any corporation, all of the stock of which is owned or controlled by the United States Government, or any department, agency, or establishment thereof, whether or not the employees thereof are paid from funds appropriated by Congress), who, subsequent to May 1, 1940, shall have entered upon service in the Merchant Marine, shall be entitled to receive, in addition to any pay for such service, compensation in their civilian positions covering their accumulated or current accrued leave, or to elect to have such leave remain to their credit until their return from such sevice.

Sec. 5. The Administrator, War Shipping Administration, may make such rules and regulations as he deems necessary or appropriate to carry out the provisions of this Act.

Approved June 23, 1943.

Four Conditions You Must Meet Before You Are Entitled To Your Old Job

(1) You must have left a permanent position with a private employer, or with the Federal Government, subsequent to May 1, 1940, to enter the Merchant Marine or the U. S. Maritime Service.

(2) You must obtain a Certificate of "substantially continuous service" from the Administrator, War Shipping Administration.

(3) You must still be qualified to perform the duties of the position which you left to enter the Merchant Marine or the U. S. Maritime Service.

(4) You must apply for such position within 40 days from the date of such Certificate.

New Rivnut Application

A new application for the Rivnut, the blind fastener created by The B. F. Goodrich Company, on turbo superchargers for high altitude planes was made possible by the development of a special Rivnut of stainless steel, the company reports.

The problem solved was the fastening of a gas seal ring in the superchargers. Originally the ring was conventionally riveted to a plate which was then welded into the supercharger case, but it was found that when repairs were necessary the riveting could not be repeated because the plate was inaccessible.

Changes in the seal ring made redesign necessary and the problem of how to fasten the new ring to the welded case was one of the most baffling in the development.

Months of development were needed to get a stainless steel which would withstand the extreme temperature differences where the head of the rivet in the exhaust gas chamber must withstand 1300 degrees Fahrenheit while the opposite end in the cold air chamber is subjected to temperatures as low as minus 68 degrees Fahrenheit.

A Merchant Marine Service Plan

By C. H. Weaver

PORT ENGINEERS in eleven major ports and six special marine warehouses stocked with spare parts are the key elements of a Merchant Marine Service Plan developed and placed in operation by the Westinghouse Electric Corporation.

The American Merchant Marine is now entering a period of expanding world trade with the men, ships and know-how sufficient to establish and maintain a commanding position in what will surely be a strongly competitive scramble for business. That this is so can be attributed to many factors — the outstanding performance of ship operators during the war period; the foresight and initiative of the Maritime Commission in providing advanced designs and ships as the nucleus of the post-war merchant fleet; and the extremely valuable contributions of naval architects, shipbuilders, repair yards and equipment manufacturers.

Having such a merchant fleet available, and the organization to exploit and man it, a safe assumption would be that private industry and Government will jointly contrive to keep it in profitable operation. Certainly this will apply to the fast "C" and "P" class ships; the Victorys and tankers. To these more or less standardized designs there will no doubt be added many other ships built for specific purposes; such types as passenger vessels—reefers—bulk carriers—car ferries.

Having carefully designed and built the best ships and the best equipment which American ingenuity and resources can provide, what next? In competitive peacetime operation, ships and ship operators must earn a profit. Otherwise, it won't be long until the country's traffic is again dependent on foreign bottoms or other modes of transportation. One answer to this question, and certainly a factor of the utmost importance, is the necessity for adequate and economical maintenance of ships and equipment. Excessive annual maintenance charges, decreased operating efficiency and time lost in port, can quickly convert potential profits into actual losses.

The standardization work of the Maritime Commission and the great increase in the number of good ships built during the war period has now made it possible for a manufacturer such as Westinghouse to undertake the job of providing ship operators highly developed facilities for maintenance and repair.

Requirements for Service

In organizing the Merchant Marine Service Plan there are three basic requirements: (1) Adequately trained personnel for the inspection, adjustment, maintenance and repair of equipment; (2) readily accessible stock of replacement parts and equipment; and (3) properly equipped and conveniently located repair shops. After a careful analysis of the various types of ships in operation, their present and probable allocation to operators, probable ports of call, the nature of the propulsion machinery and auxiliary equipment installed on each ship and its interchangeability between ships, a Merchant Marine Service Plan has been organized and put into operation which is designed to provide the fast, dependable maintenance and repair facilities which ship operators require.

The Merchant Marine Service Plan

The Merchant Marine Service Plan will provide these essential facilities:

(1) Port Engineers in each major domestic port area.
(2) Strategically located warehouse stocks of replacement parts and equipment.
(3) Competent service and repair engineering and shop personnel.
(4) Modern, well-equipped repair shops in each major port.

The extent to which these four essential facilities are available in each port is shown on the map.

Port Engineers

The Westinghouse port engineer



A Westinghouse Port Engineer is on the job with his specially outfitted truck.

is the keystone of the entire service program. Upon him and the manner in which ship operators make use of his aid will depend the successful application of the various facilities to the economical operation and maintenance of shipboard equipment.

These Port Engineers have been selected very carefully. They have a thorough knowledge of all Westinghouse shipboard equipment — turbines, gears, condensers, generators, motors, switchboards, control, brakes, Micarta bearings, searchlights and many other items. Equally important, they know ships and the particular requirements of ship operators.

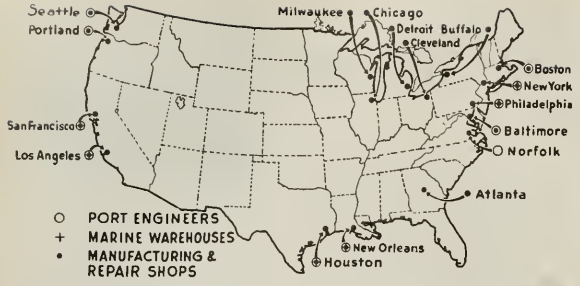
The function of the Westinghouse Port Engineer is to establish contact with ship-operating personnel, afloat and ashore; visit ships in his port area at regular intervals; advise on the operation, adjustment and maintenance of equipment; expedite the procurement of replacement parts, equipment and material; and arrange for personnel and shop facilities to handle detailed inspection of equipment and necessary repairs. In carrying out his functions, the Port Engineer will have the full support of all local engineering and shop facilities plus the additional backing of headquarters engineering, manufacturing and research.

A comprehensive system of records and reports has been set up whereby each Port Engineer will be promptly acquainted with the activities of other Port Engineers. In this way, troubles on one ship, and methods of correcting them, can be anticipated on other ships having similar equipment. Preventive measures and maintenance of this kind can be of real value to ship operators.

Marine Warehouse Stocks

This phase of the problem required considerable study; first, as to the location of stocks, and secondly, the items which should be carried in stock. Warehouse space costs money

(The author is manager, Marine & Aviation Sales Department, Westinghouse Electric Corporation, East Pittsburgh, Pennsylvania.)



Westinghouse Marine Service map showing location of Port Engineers, Marine Warehouses and District Manufacturing and Repair Shops convenient for marine work.

to maintain and operate. Stocks to service the Merchant Marine mean a large investment.

Realizing that a part carried in stock in New York would be of little value to a ship in New Orleans which needed it today, six special marine warehouse locations were selected and are now in operation. These six locations are as follows: Jersey City, N. J.; New Orleans, La.; Houston, Texas; Wilmington, Calif.; San Francisco, Calif.; Essington, Penna. There naturally will be a complete interchange of stock between these six warehouses.

As the basis for selecting initial warehouse stocks, a complete survey has been made of all ships built since the inception of the Maritime Commission program in 1937, and the Westinghouse equipment of which there is a record installed on board each ship.

Individual I M B cards were punched for each part item. After going through the tabulating machine, the resulting summary showed the total quantity of each part in service, the quantity used on each ship and other information necessary for the entry of stock orders in the shop and distribution of stock to the various locations.

This parts survey on which the stocks are based covered more than 1400 ships, not including Libertys or military types. The stock itself will include more than 5000 different kinds of replacement parts having an aggregate sales value of approximately $2,000,000. A careful estimate indicates that from 90-95% of all Westinghouse steam and electrical equipment in merchant service will be protected.

As an example of the many different kinds of parts stocked there will be the following for turbines: completely bladed spindles, blades and blading material bearings, carbon rings, hand valves, governor parts, maneuvering valves, and miscellaneous details. For reduction gears: complete sets of rotating parts, pinion and gear elements, bearings, and coupling. For motors and generators: spare units in some cases, armatures, armature and field coils, bearings, brushes and brush-holders and insulating details. For switchboards, panelboards, and control equipment: instruments, relays contacts, operating coils, circuit breakers and parts, instrument transformers, limit switches, master switches, pushbuttons, and resistor elements. Stocks of this type must cover everything from the 8500-shp bull gear for a C-3 vessel to a grease fitting for a 1-hp motor and a can of soldering flux.

In addition to the special marine warehouses, a regular warehouse stock of electrical parts is carried in practically every port. These parts, although not specifically intended to service marine equipment, are available to meet many emergency needs which may arise.

Engineering and Shop Personnel

Competent engineering and shop personnel, thoroughly familiar with the design, construction and operation of all of the many types of steam and electrical shipboard equipment and trained in factory-approved methods of maintenance and repair, is an absolute requisite to a well-rounded service program. An adequate corps of such men are already in each major port. Their function will be to supplement the activity of the Port Engineer and provide the necessary technical skill and labor for complete inspection, testing, adjustment and repair of equipment as required or to supervise such work if carried on by others.

LOCATION OF WESTINGHOUSE MARINE WAREHOUSES AND PORT ENGINEERS

Warehouse Locations	Vessels Serviced	Ports Served	Port Engineers	Location
415-421 Montgomery St. Jersey City, N. J.	Cargo, Passenger Tanker	New England and Mid-Atlantic Coast	S. D. Henderson F. J. Donohoe G. C. Taylor G. E. Johnson W. G. Phillips	Boston, Mass. New York Philadelphia Baltimore Norfolk
118 No. Front St. New Orleans, La.	Primarily Cargo & Passenger	Gulf and South Atlantic Coast	H. R. Worthington	New Orleans
812 Live Oak St. Houston, Texas	Primarily Tankers		E. P. Renouf	Houston
1148 Wilmington Blvd. Wilmington, Calif.	Primarily Tankers	Pacific Coast	J. L. Baer	Los Angeles
215 The Embarcadero San Francisco, Calif.	Primarily Cargo and Passenger	Pacific Coast	W. N. Hornberger H. Andrews C. D. Singer	San Francisco Portland Seattle
Westinghouse So. Philadelphia Works Essington, Pa.	Cargo Passenger Tanker	Atlantic, Gulf & Pacific Coast		

Repair Shop Facilities

Lastly, but by no means the least important to a comprehensive marine service program, there is the necessity for providing conveniently located, well-equipped shops for the repair of equipment ashore where the size of the job or the nature of the work to be done makes this preferable to doing the work on board ship. Westinghouse has long maintained a number of such District Manufacturing and Repair Shops. There is one in each major domestic port. What makes these shops of particular importance to the Merchant Marine Service Plan is that they are now backed up by adequate stocks of parts and materials. These shops are equipped to do a precise, factory-approved job using genuine factory parts and materials. Certain parts can be manufactured according to original designs and specifications if for some reason they are not available in stock. Facilities are provided for necessary testing of equipment before it is returned to the ship.

Upper: Interior view of one Manufacturing and Repair Shop, showing facilities for repair of electrical equipment on first floor.

Lower: A propulsion turbine spindle being repaired in the Westinghouse Emeryville, Calif., plant, where complete facilities are available for all types of steam and electrical repair.



Conclusion

This article has attempted to analyze the maintenance and repair problem of merchant ship operators. While written from the viewpoint of the manufacturer of equipment, it has incorporated the opinion of many qualified operating men and the experience of many years of manufacturing for and serving the marine industry. It has further outlined the facilities which one manufacturer, the Westinghouse Electric Corporation, has set up to meet these requirements. The continued success and growth of any such service program depends on two things: first, the extent to which the facilities provided really meet the need; and second, the willingness of ship operators to utilize the facilities made available to them.

Choice of Organic Finishes

(Continued from page 738)

panels which will not fail under ordinary condensation will fail if soaked in water. Water-soak tests may go as far as 2000 to 4000 hours before one fails.

Humidity tests—and this is just arbitrary and may not be right—are made at 125° F. and 100 per cent humidity. They are made by venting live steam and air into the top of the room. There is not very much stratification. On some types of materials it is necessary to make a cycle test at this point. In other words, some paints will soak up a little moisture, they will soften a little bit, and then they will stay just about as they were. They won't fail by blistering or crazing or checking. They may dull down or discolor a trifle, but they are still pretty good. On the other hand, those same finishes if put into a cycle test and allowed to dry out periodically will fail. That is especially true of materials which are made for exceptional grease resistance and which sacrifice some of the water resistance qualities to gain in grease resistance. What probably happens is a swelling up of the film due to the absorption of moisture, and when it dries out the material is so hard it cracks. Figures 9 and 10 show some of these

(Continued on page 778)

On the Ways—

SHIPS IN THE MAKING

United Fruit Will Build Fleet of Nine Vessels

The U. S. Maritime Commission recently gave its approval to the United Fruit Company for the building of nine refrigerated cargo ships. The fleet will be constructed at the Bethlehem-Sparrows Point Shipyard in Baltimore, Maryland.

A construction subsidy of $1,304,000 was also granted on a cost of $2,799,000 for each vessel. The Commission is to accept as trade-in nine vessels of the United Fruit Fleet, the Toloa, Cartago, Santa Marta, Abangarez, Hibueras, Turrialba, Atenas, Carillo and Zacappa, in accordance with the Merchant Marine Act of 1936.

The new ships will each be 385 feet six inches long; 4600 dw. tons and with 197,000 cubic feet of refrigerated and insulated cargo capacity. They will be capable of making 16 knots. Each ship will carry a crew of 48 and have accommodations for 12 passengers.

The United Fruit Company plans to operate the new vessels on several routes, including U. S. Pacific West Coast Ports, United Kingdom and Western Europe; between U. S. Pacific Coast ports and Central and Northern South America and West Indies; and between United States Atlantic and Gulf ports and Central America, Northern South America and West Indies.

ERRATUM—
On the Pleasant Side

In our November issue we published a list of American merchant vessels lost in the Pacific, just as it was received from the Maritime Commission. The last item on the list was the SS United Victory.

The American President Lines was prompt in advising us that the SS United Victory was NOT lost. It is, at this writing, docked at Pier 44 in San Francisco.

Any further corrections of this nature will be very welcome.—Ed.

Pleasure Yachts Built at Ingalls

Luxurious appointments, streamlining, all-welded construction and fireproof materials are features of the 90-foot yacht designed for the Ingalls Shipbuilding Corporation by George G. Sharp, well-known New York naval architect.

The all-steel craft, as well as larger ones, will be built after war contracts are completed at Ingalls' Decatur (Alabama) shipyard on the Tennessee River.

The craft will be diesel-powered with two 200-hp engines (twin screw), 90 feet in length, with a beam of 21 feet and a draft of 5 feet, the yacht will have a low operating cost. Her top speed will be between 15 and 18 miles per hour. Insulation will be used to advantage not only in controlling temperatures for physical comfort but in eliminating noise on the all-steel craft.

Decatur Yard to Build River Cruise-Liner

Beside the building of yachts, postwar plans at the Decatur yard include construction of a 300-passenger Tennessee River liner for weekly cruise trips of 1300 miles between Paducah, Ky., and Knoxville, Tenn. This boat is a drastic departure in design from the usual stern-wheelers seen on the Tennessee, featuring large play decks, lounges, and spacious staterooms.

A transparent blister atop the pilot house giving the pilot a 360-degree range of vision and openings similar to those on LST's will be two of the boat's features. The blister idea was borrowed from those atop bombers for gunners.



This beautiful 90-foot yacht, with all the features made possible by peace, was designed for Ingalls by George G. Sharp, well-known New York naval architect. The yacht's interior and exterior will have that appearance of comfort combined with simplicity of smart styling.



THE NORTHWEST OBSERVES NAVY DAY

Led by the battleship Iowa, flagship of Rear Admiral Oscar C. Badger, USN, ten ships, most of them of the great Third Fleet, steamed into Seattle's harbor on October 17, to make ready for Navy Day. To Seattle their arrival washed away the years of war. The fleet was in again!

With a tremendous program of recreation available, the returning officers and men of the Navy joined forces with Puget Sound citizens to make a grand and glorious homecoming of the return of parts of the United States' occupation forces in Japan.

When putting his ship into her first port of call in the continental United States, Admiral Badger said: "Elliott Bay is like the gates of heaven."

Navy Day saw thousands of Seattle civilians make landings on the decks of the following warships: Bunker Hill, carrier; Iowa, Colorado, Arkansas, battleships; Fulton, submarine tender; Capitaine, submarine; Duluth, cruiser; Walker, destroyer; Hardhead, submarine; and Nicholas, destroyer.

At Bremerton, just across the Sound from Seattle, the battleships Pennsylvania and Massachusetts, carrier Essex, and the cruiser Pittsburgh were visited by thousands living on the Olympic peninsula.



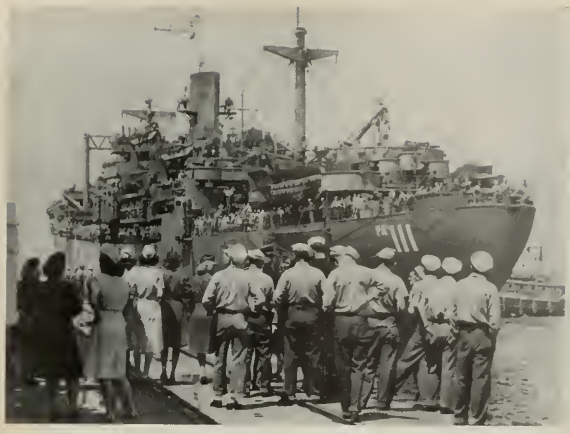
Top: Aircraft carrier, USS Independence, with the cruiser, USS Topeka, tied up at Portland, Oregon, on Navy Day.

At Seattle: "Oh, boy —a real gun to play with." Mother worries as Junior plays. Scenes such as this occurred aboard many ships in Coast ports on Navy Day.

To the families of Navy men, it was their first chance to board the fighting ships and to see first hand the quarters and equipment of war. Thousands visited the warships, such as the heavy cruiser (at lower right) docked at Portland, Oregon.

Resumption Of Intercoastal Service

Resumption of its intercoastal service was announced by Hillman Luedemann, northwest vice president of the McCormick Steamship division of Pope and Talbot, Inc. The SS Lawrence Victory was scheduled to leave Portland on November 7 for Baltimore and Norfolk. Westbound sailings have started from Philadelphia, Baltimore, and Norfolk. The Lawrence Victory, after departing Portland, will load also at Seattle, San Francisco, and Los Angeles. The ship is one of several allocated to McCormick by the War Shipping Administration.



USS Grundy, the attack transport built at the Ingalls yard in Pascagoula, Miss., docks at San Diego with troops from the Pacific area. Many of the C-3 type vessels on which this yard has concentrated during the war are busy bringing troops home.

Callaghan, went down, lost by enemy action off Okinawa. The others, the U.S.S. Gwin, U.S.S. Bristol, U.S.S. Hopewell and the U.S.S. Lowry, participated in the Victorious Fleet entering Tokyo Bay. The U.S.S. Irwin and U.S.S. Cassin Young assisted in saving the stricken carrier Princeton and safely taking off survivors. The U.S.S. Irwin is credited with firing 12,780 rounds of 5-inch ammunition during the Okinawa campaign.

Consolidated Steel's New Series of Vessels

The SS Messenger, the first of a fleet of ten C-2 cargo vessels, was launched on October 20 from Consolidated Steel's Wilmington shipyard. Mrs. E. G. L. Smith, wife of the Purchasing Agent for General Petroleum Corporation, was the sponsor.

The SS Spitfire, the second of this fleet, was launched at the yard on November 9. Mrs. Torrey H. Webb, wife of the Vice President of The Texas Company, sponsored the ship.

The SS Messenger, together with the SS Spitfire and her eight sister ships, are the largest vessels to be built at Consolidated's Wilmington yard. These C-2's are 460 ft. long, have a beam of 63 ft., and a molded depth of 40'6". They are of 14,000 tons displacement, and their design includes comfortable accommodations for eight passengers.

War History of the San Pedro Destroyers

At right: The USS Harwood on her shakedown cruise.

Below, far right: Commander Reid P. Fiala, USN, publishes his orders and assumes command at commissioning of DD 861, USS Harwood, at the San Pedro yard of Bethlehem Steel Co., Terminal Island, California.



The battle history of the San Pedro destroyers spans the whole war. There were San Pedro destroyers in the first actions off Italy and there were San Pedro destroyers in the fleet in Tokyo bay. Some day the whole story will be pieced together with all the details of the gallantry of the men and the quality of the ships they manned.

The ship commissioned September 28, the U.S.S. Harwood, is a little late for the battle glory of her sister ships, but her quality is the same, and as she steams out to make her mark in the defense of our nation, she also holds the distinction of being the last vessel of war built by the San Pedro Yard of Bethlehem Steel Company.

One of her sister ships, the U.S.S.



COMMISSIONING IN SEATTLE





Above: Left, Commander H. Q. Murray, skipper of the newly commissioned destroyer, USS Richard B. Anderson, receives Croix de Guerre from Commander Charles J. Hardesty, senior assistant supervisor of shipbuilding, 13th Naval District. Comdr. Hardesty, who acted on behalf of the French government, presented the medal for "exceptional service as Captain of the Destroyer Jeffers, during the liberation of France."
At right: DD 786, also known as the USS Richard B. Anderson.

S.S. Coxcomb Hill Launched

The S.S. Coxcomb Hill, next to the last of the 153 (T-2) tankers built at the Swan Island Yard of the Kaiser Company, was launched on October 20th with Mrs. Joseph V. Santry, wife of the president of Combustion Engineering Company, as sponsor. Mr. Santry was present and briefly addressed the 500 guests at the launching ceremonies. His daughter, Margaret Louise, was flower girl.

Other participants in the christening were Edgar F. Kaiser, general manager of the Portland-Vancouver Kaiser Yards, who served as Master of Ceremonies, and the Reverend James Fogarty of the University of Portland, who pronounced the invocation. Mrs. Santry was attended by Mrs. Robert L. Johnson, wife of the manager of Combustion Engineering's San Francisco office, and Mrs. R. E. Chase, wife of the manager of Combustion's Seattle office, as matrons of honor.

Combustion Engineering furnished over 60 per cent of the boilers used in the ships built in all the Kaiser yards, and the Coxcomb Hill was the 150th tanker built at Swan Island to be equipped with Combustion boilers.



Edgar Kaiser, general manager of Swan Island, Portland, Oregon, with Mrs. Santry, sponsor of the SS Coxcomb Hill, and Joseph Vincent Santry, president of Combustion Engineering Company, New York City, are shown prior to the launching of the 146th T2 tanker built at the Kaiser Company Swan Island shipyard. The tanker is equipped with boilers made by Mr. Santry's firm.

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
MARINE UNDERWRITERS
200 BUSH STREET . . . . . SAN FRANCISCO
Offices at: Calman Bldg., Seattle • 111 West 7th St., Los Angeles

World Trader Heads Commerce Chamber



Brayton Wilbur, world trade leader, just elected 1946 president, S. F. Chamber of Commerce.

Frazar & Hansen

(Continued from page 756)

items handled in the course of an ordinary business day.

O. C. Hansen is well known to foreign traders, particularly on the Pacific Coast, for his aggressiveness and vision on matters of foreign trade. Besides being the president of the Foreign Trade Association of the San Francisco Chamber of Commerce, he is the inspiration of the World Trade Center, which is well on the way to becoming a reality. This center will consist of several modern office buildings, complete with landing fields atop their roofs, post office, display rooms, warehouses, and connecting overhead walks, wherein may be concentrated the foreign trade life of San Francisco. Here shippers, freight forwarders, consuls, merchants and foreign visitors would be under one roof to discuss the problems of their business, which today, more than at any time before in history, is recognized as having such a tremendous bearing on the peace and security of tomorrow's world. That Mr. Hansen is well aware of the importance of foreign trade in world affairs is indicated by the issuance of "International Merchant," a monthly publication of the House of Frazar & Hansen, thousands of copies of which are regularly sent all over the world. For on the cover of this publication appear the words: "For the **Improvement of International Relations—Through Trade.**"

Choice of Organic Finishes

(Continued from page 773)

failures, including both blistering and crazing.

Any organic finish will eventually fail in grease or animal or vegetable oils. The one that will give the least trouble should be selected. Grease resistance panels are made by taking a panel and smearing one half of it with a mixture of 50% oleic acid and 50% lardoil, and placing it in an oven at 110 C. for 200 hours. The panel is examined about every 24 hours to determine if all the grease has been absorbed—if so, more is added. At the end of 200 hours it is taken out, washed with a mild soap, and examined. In some cases the finish is lifted just as if a varnish remover had been acting on it. In other cases there is simply a little discoloration. Then new scratch and bend tests are made for comparison with the original. Sometimes the finish is apparently improved. The grease lubricates the top surface so that the cutter slides over.

There are a number of special tests which are made on occasion, such as staining with fruit juices, staining with coffee or tea, and odor tests. It is necessary to check the odors on any finishes going, for example, into the inside of a refrigerator. The method used now is to dilute the amount of air taken in from the sample and the outside room air down to the point where the odor cannot be detected; in other words, it is a threshold failure, but results are hundreds of per cent out. As yet no one has worked out a satisfactory method for measuring odor.

Now the point comes up on how to evaluate all the various factors. One way is to make up a chart and grade all the panels. Each characteristic is given a rating from one to ten. Certain characteristics such as hardness, impact, fading, humidity, color and gloss retention, and ability to be repaired must pass with at least 8 or over.

It takes some judgment to weigh each characteristic in evaluating the finish, and, from time to time as experience dictates, the relative weight is changed. The attached valuation chart is now obsolete but will serve to illustrate the method. You will note that the valuation would be 100% only if each characteristic received the perfect rating 10. Failure of any critical characteristic immediately eliminates the finish. The best finish for the application, or several acceptable finishes, may be selected by methods which are unprejudiced, free from personal bias, and which are reproducible. The causes of failure and the characteristics of the finishing system needing improvement are readily shown. Therefore the intent of the testing method has been achieved.

Evaluation of Results for Final Selection

Permanence	Rate Factor
Hardness*	3
Impact*	10
Bend	5
Ductility	5
Fading Ultra Violet arc*	12
Fading Darkness	2
Aging	3
Grease*	25
Water	3
Humidity Continuous*	14
Humidity Intermittent*	18

$$\frac{\text{Sum}}{10} = \%\ \text{permanence}$$

Appearance	
Color*	30
Gloss*	30
Smoothness	15
Uniformity	25

$$\frac{\text{Sum}}{10} = \%\ \text{appearance}$$

Workability	
Plant Handling	10
Opacity*	50
Flow	10
Repairability*	30

$$\frac{\text{Sum}}{10} = \%\ \text{workability}$$

Final Rating—Value of Finish

% Permanence	x 50
% Appearance	x 30
% Workability	x 20

$$\frac{\text{Sum}}{10} = \text{Rating of Finish}$$

*Material is rejected if any rating marked * is lower than 8. All ratings are given from 10 down to 0 on the basis that 10 is perfect.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton



Scene of the gathering at the Schell meeting at San Francisco Propeller Club in November.

USMC's Schell Speaks to Propeller's

Samuel Schell, executive director, U. S. Maritime Commission, and deputy administrator, War Shipping Administration, came out from Washington, D.C., to address the Propeller Club of the United States, Port of San Francisco, at the St. Francis Hotel, on November 21.

His remarks were cogent. He warned that the Army and Navy were maintaing large merchant fleets of their own and they will be usurping the functions of the Merchant



Speakers table, at extreme left: Fred L. Doelker, Samuel Schell, speaker; Joe Moore, Jr., president of Propeller Club; Frazer Bailey; E. J. Griffith, past president of Portland Propeller Club; Felix Isherwood, with War Shipping Administration; Howard Middleton, War Shipping Administration; and Eugene Hoffman.



Samuel Schell, executive director, U. S. Maritime Commission.

Marine. He emphasized improvements of the freight rate structure and the promises that the Maritime Commission would insist on adequate rates for the steamship industry in order to bring about a uniform front toward the Government and public. He suggested that they have frequent conferences of steamship company presidents who could agree on at least some points now in a controversial state. He repeated that labor and management must get together or both will suffer, and finally, that world trade is the key to prosperity for steamship companies, shipyards, and everyone concerned with them. The weakness in any program for expansion of shipping, whether it be commercial or military, is the almost complete lack of interest on the part of the interior sections of the country. (A discussion of some of these points will be found in an Editorial in this issue.)

During the meeting several new members were introduced into the Club. They were: Guy M. Hanna, assistant port engineer, Shepard Steamship Co.; Theodore B. Lyman, director of labor relations research, Matson Navigation Company; Hosmer E. Smith, fuel oil representative, Standard Oil of California; Amos Stackhouse, Jr., consulting engineer, Harry W. Parsons, Inc.; Harold D. Starr, McCormick Steamship Co.

One transfer from the Port of New York to the Port of San Francisco is Edwin W. Hannay, Jr., manager, Planning & Production Department, Graham Ship Repair Co., Oakland; another transfer from Port of Washington, D. C., is Frank J. Zito, assistant to the president, Deconhill Shipping Company; and, a transfer from Port of Los Angeles-Long Beach is T. R. Henry of Stow Manufacturing Company.

The nominating committee was appointed by President Joseph A. Moore, Jr., and was composed of Messrs. Fred L. Doelker, chairman, Hugh Gallagher, Marshall Levis, Arthur B. Poole, and Charles L. Wheeler, who reported their selections for the 1946 Officers and Board of Governor members as follows:

President, Joseph J. Geary
1st Vice Pres., W. Miller Laughton
2nd Vice Pres., John E. Cushing
3rd Vice Pres., W. R. Chamberlin
Sec'y-Treas., Eugene F. Hoffman

Hugh Gallagher, Carroll Reeves, Joseph J. Geary, E. P. Crossan and W. Edgar Martin, governors for one year; Dearborn Clark, J. J. Coney, Gregory Harrison, W. Miller Laughton, and K. C. Tripp, two-year governors; E. H. Harms, E. Russell Lutz, Earl Livingston, Joseph A. Moore, Jr., and George E. Swett, three-year governors.

Cushing Back at American-Hawaiian

John E. Cushing resigned from the War Shipping Administration, early in November, to resume his prewar position as president of American-Hawaiian Steamship Company. His duties as assistant deputy war shipping administrator in charge of the Pacific area will be divided between Felix Isherwood, who will handle foreign services, and W. Creighton Peet, who will have charge of domestic services and other matters.

Mr. Cushing left the presidency of the intercoastal line in February, 1942, to become Pacific Coast director of the newly formed war shipping board at the request of Vice-Admiral Emory S. Land, chairman of the Maritime Commission. In May of the same year he went to Washington to take charge of all WSA operations. Ten months later he returned to San Francisco as assistant deputy administrator in charge of all operations in the Pacific area.

He will take a prolonged vacation before returning to American-Hawaiian toward the end of the year.



COAST EXPANSION OF BETHLEHEM

Left to right: T. S. Clingan, gen. mgr., West Coast Steel Plants; H. H. Fuller, vice pres. in charge of West Coast Operations, Bethlehem Steel Company; and W. C. Eshelman, gen. supt., South San Francisco Plant. Mr. Fuller outlined Bethlehem's West Coast expansion program and answered questions put to him by various members of the press, following the tour of South San Francisco Steel Plant, during luncheon given by the company at California Golf and Country Club.



Ship-rigging Firm Moves in San Francisco

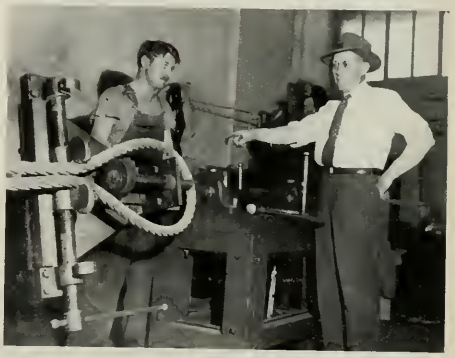
VIC KNUDSEN, who has been in the ship-rigging business on the San Francisco waterfront for the past 26 years, has moved into the building which he recently purchased at 134 Sacramento Street.

Knudsen, sole owner of the enterprise which bears his name, has a lifelong background of the sea, and a wide and varied experience with ships all over the world. Born in Denmark 52 years ago, the son of an importer and exporter, he decided to forego a formal education to follow the sea. Vic went to sea on sailing ships in 1907. Upon coming shoreside he worked for the oldest rigging loft on the Atlantic Coast, the Arthur N. Taylor Rigging Co., Philadelphia, and during the First World War worked at the Newport News Shipyard. Coming West in 1917 to Portland, he went to work for the Haviside Company of San Francisco, rigging five-masted schooners. He later continued with the same company in San Francisco.

In 1929 Knudsen opened a rigging loft for the C. J. Hendry Company and remained there as superintendent until 1943 when he went into business for himself under the name of "Vic Knudsen, Ship-Rigging."

Knudsen was experimenting with a new type wire rope cargo net when he opened his first shop on Howard Street in 1943. Starting with four employees, the growth of his business was phenomenal with many times the original force working in the other shops which were acquired to house the overflow. Many hundreds of thousands of feet of wire rope were cut and fabricated by his special method into cargo nets for both the Army and Navy, in addition to large quantities of stevedore equipment. He has now consolidated all activities on Sacramento Street under one roof in the new building which he acquired this summer. Vic is currently putting into production a new type ship's pilot ladder which he has recently patented.

Recognized as one of the best ship riggers on the Pacific Coast, Knudsen has the reputation of never having tied up a ship while doing rigging work or having delayed a sailing date. With his up-to-date rigging shop he is in a position to furnish every type of stevedore equipment, including wire rope save-alls made by his patented process, and to do all types of ship-rigging. As soon as supplies are available, a modern sail loft will be opened on the top floor of the new building.



At right: Eye splicing in large cable. Vic Knudsen at right.

Below: "Framing" installation of Navy wire cargo net.





STANDARD OIL EXECUTIVE

E. L. Stewart, manager of Construction and Repair Division, since July of this year, for Standard Oil Company (New Jersey), Marine Department.

General Electric Honors Retiring Engineers

At a dinner at the Engineers Club, members of the General Electric Company's San Francisco Office honored H. C. Stanley and R. F. Monges of the Engineering Section, who are retiring from active service with the organization this month.

Both Mr. Monges and Mr. Stanley had retired previous to the outbreak of the war, but returned to G.E. during the rush of work which pyramided as the war effort got under way. With the struggle ended, they are once more retiring for some well-earned relaxation. Dick Monges to his favorite hobby of golf, and Harry Stanley to his "tinker shop," where he turns out interesting woodwork and metal pieces.

General Electric co-workers presented Mr. Monges with a 17 jewel Hamilton watch and a pair of "hot" golf socks at the dinner, while Mr. Stanley was given a G.E. Electric Blanket order (good when one is available), a humidor and pipe tray, and a quarter-horsepower motor for his tinker shop.

Mr. Monges and Mr. Stanley have many friends in electrical and engineering circles, as well as long contact with marine and shipbuilding groups, with whom they worked during the war.



George Barr, marine superintendent San Francisco office, General Electric Company, presenting H. C. Stanley (right) and R. F. Monges (left) with some going-away gifts at a dinner given in their honor in November, at the time of their retirement from service.



Rear Admiral Graver C. Klein, USN.



Rear Admiral C. O. Kell, USN.



Rear Admiral N. L. Rawlings, USN.

THREE PACIFIC COAST OFFICERS PROMOTED TO REAR ADMIRALS

In recognition of his record as industrial manager at the Mare Island Navy Yard, Grover C. Klein was appointed a Rear Admiral and is slated to be the commanding officer of the shipyard when national reorganization of Navy yards goes into effect around December 1, 1945.

He graduated from the U. S. Naval Academy in 1916 and since that time has served aboard the USS New Hampshire, USS Hancock, was stationed at the Boston Navy Yard, Cavite Navy Yard and other shipbuilding activities, as well as in the Philadelphia Navy Yard. He was promoted to Captain in December, 1941.

At the Naval Academy he was instructor of aeronautics. He came to Mare Island in 1944 to relieve Rear Admiral Fred G. Crisp. The new Rear Admiral is well known to both naval and commercial shipping interests on the Pacific Coast.

Another promotion to the rank of Rear Admiral was bestowed upon Captain Norborne Lewis Rawlings, Naval Academy graduate of Class of 1917, who was stationed at U. S. Naval Drydocks, Hunters Point, San Francisco. He was officer-in-charge and manager of Hunters Point, which operates as an annex to the Navy Yard, Mare Island, and since his first coming to this station in December 1942, he had been in charge of expansion in facilities and personnel. He has received the Victory Medal, American Defense Medal, and Commendations by Secretary of the Navy. At present he is Director of Shore Division, Bureau of Ships, U. S. Navy, Washington, D.C.

The San Francisco bay area shipbuilding fraternity was pleased to hear of the recent promotion of Claude Owens Kell to the rank of Rear Admiral in the U. S. Navy.

On graduating from the Naval Academy in 1915, he served on various naval vessels during the first World War, and was appointed to the Construction Corps in 1918. After completing post-graduate work in naval architecture at the Massachusetts Institute of Technology in 1920, he saw service at sea and in Navy yards at Boston, New York and Norfolk. In 1941 he was awarded the Linnard Prize by the American Society of Naval Architects and Marine Engineers.

During World War II he was responsible for the supervision of the very extensive U. S. Navy shipbuilding program in the Twelfth Naval District from 1941-1944. He is now industrial manager of the U. S. Navy Yard at Pearl Harbor, T. H.

Cunard White Star Appointments

Cunard White Star, Ltd., announce that on December 1 they have appointed T. C. Lockwood to be general manager in Canada for their Canadian services. Mr. Lockwood has been associated with the Cunard Canadian services since 1920 in a senior executive capacity and enjoys a high reputation in Canadian shipping circles. At the beginning of the war he was seconded for service with the Canadian Government and was appointed as controller of transport for the whole of Canada. He has now been released from these duties to take up his new appointment with the company.

Mr. Lockwood will be assisted in the management by T. J. Royden, who has been associated with the company's business for the past ten years.

Blackmon Resigns

Hendley Blackmon resigned as manager of Westinghouse Electric Corporation Editorial Service to join the McGraw Hill Publishing Company as Electrical Editor of "Product Engineering." Pending the return of Lt. Carl Nagle, now on duty in the Pacific with the U. S. Navy, H. C. McDaniel will act as supervisor of Editorial Service and be responsible for Westinghouse's technical and trade magazine publicity activities.









Top, left, speakers table, left to right: H. G. Rathmeyer, Westinghouse Corporation, Seattle; G. B. Rosenblatt, Pacific Coast Marine manager, Westinghouse, San Francisco; M. D. Calder, president, Seattle Propeller Club.

Top, right: Captain A. M. Artinson, USCG, assistant district officer, 13th Naval District, listens with interest to a lecture on future of marine turbine propulsion while James C. Gow, Alexander Gow, Inc., seems to be making mental note of questions to raise.

At left: Rear Admiral Philip F. Roach, USCG (retired), talking the meeting over with P. M. R.'s representative, Richard F. Gorman.

Above: Lindsay C. Fletcher, marine turbine engineer, Westinghouse, Philadelphia, speaking on future of marine turbine propulsion. Far left: K. L. Howe, H. G. Rathmeyer, M. D. Calder, Commander Michael Shea, and R. L. Von Rossow.

Seattle Propeller Club Meet

The Propeller Club of the United States, Port of Seattle, members occupied the very edge of their chairs at the meeting October 24, at Seattle's Arctic Club when Commander Michael Shea, skipper of the submarine Raton described his ship's patrols and exploits in Japanese waters up to V-J day.

Education went with the thrills when the gathering heard from Lindsay C. Fletcher, marine turbine engineer, of Westinghouse. Mr. Lindsay presented a highly interesting and informative illustrated lecture on the future of marine turbine propulsion.

Immediately following dinner a number of new members were presented to the group. Among those greeted by older members were: Chester Miller of the Puget Sound Bridge and Dredging Co.; Capt. H. W. Nygran, master mariner, retired; Ross W. Copeland, vice president and general manager of the Ballard Marine Railway; F. A. Gosse, F. A. Gosse Company; A. W. Shipman, terminal superintendent of the Port of Seattle; Dewey Bennett, senior liaison officer, WSA; Walter McCray, of Walter McCray diving company; Frank Cramer, Steam Sup-

ply and Rubber Company; James H. Frink, manager diesel division, Washington Iron Works; Norton Clapp, vice president, Alaska Transportation Company (on active duty U. S. N.); A. W. Copp, owner of Northwest Ship Repair Company, and H. W. Cammann, manager Northwest Ship Repair Company.

An announcement was made that the date of the club's 19th Annual Steamship Dinner had been set for December 8. The affair will be held at the Washington Athletic Club and the usual festivities will be on the program, according to the committee in charge.

The Lightship Is On Duty Again

The lightship, San Francisco, is on duty again 12 miles off the Golden Gate, a floating beacon to vessels from all ports of the world enroute to one of the busiest harbors in the world. This is the first time since December 1941, that she has "gone outside the head." The lightship has been stationed at Yerba Buena Island.

Commanded by Lieutenant Ross C. Anway, 55, veteran of 42 years Coast Guard service, the 112-foot two-masted vessel, with her red hull and white block letters San Francisco painted on her sides, will be on "outside duty" six months and then will come in for general repairs while the lightship Relief or a sister ship will go on duty.

Grace Line Shift

D. P. Darling, assistant operating manager of Grace Line, Inc., has been appointed assistant manager of Panama Agencies Co., a Grace subsidiary, it has just been announced by company officials. He leaves shortly for Cristobal, C. Z., to take over his new duties.

Connected with the New York offices of Grace Line since 1941, Mr. Darling returns to Panama where he was born and began his steamship career with Panama Agencies Co. in 1938.

Mr. Darling is the son of Dr. Samuel Taylor Darling, the world-famous malariologist, who was chief of the laboratory at Ancon, C. Z., during the building of the Panama Canal, and for whom the Liberty ship Samuel T. Darling, built in 1943 by the Southeastern Shipbuilding Co. of Savannah, Georgia, was named.



R. V. Winquist congratulates Captain Paul Legrand, new commander of the French liner, Wisconsin, as Chalmers Graham, attorney for French Line, looks on.

The Wisconsin Turned Over to French Line

The War Shipping Administration turned over the French steamer Wisconsin to the French Line, the owners, in San Francisco on November 14, the first foreign tonnage seized during the war to be returned by the United States Government in that port.

When the vessel was seized in Los Angeles early in 1942 she was the last ship flying the tri-color on the Pacific Coast. Then, with tonnage at a premium, the vessel's registry was changed to Panama and in command of Captain A. P. Galdins she made 20 voyages marked by brushes with Japanese submarines, Nipponese bombers, while freighting precious cargoes out of this port to the South Pacific in the early perilous days of the war. She was never damaged, but her log reveals one of the most daring sagas of a merchant ship running the attempted Japanese blockade to Island fortresses in the South Pacific.

On behalf of the French Line, the General Steamship Corporation, Pacific Coast agents, took possession of the ship which immediately started loading local products to resume the French Line's Pacific Coast-European passenger and freight service which before the war operated on regular schedule. Ray Winquist, vice president of the General Steamship Corporation, said that as quickly as possible the post-war schedule will be reinstituted.

Present at the official return of the Wisconsin to the French Line were Vice-Consuls of France Andre Rousselet and Guy Toffin, representing French Consul General Jacques Baeyens, who is in Washington; Lloyd C. Fleming, Chief Administrator for the War Shipping Administration, representing Deputy Administrator of WSA, John E. Cushing; Captain Paul Legrand, new skipper of the Wisconsin, who relieved Captain A. P. Galdins; Consul General Alberto Aleman of Panama; Captain N. D. Perlins, representing Admiral Scannel, Collector of Customs Paul Leak; Commodore J. H. Wills, USN; Ray Winquist and Alan K. Hulme, vice presidents of the General Steamship Corporation, as well as Captain Al T. Hunter, Captain Harry H. Birkholm; Morse Frazier; Captain J. M. Juhan of the French Ministry of Shipping, and Paul Verdier, president of the City of Paris, which store started aboard a ship in San Francisco loaded with goods from France sent by his grandfather in the days of the gold rush.





At left, top: Ray Sullivan, district manager.
Below: Joe Shafer, combustion control engineer.



Left to right: Joe Shafer; Gordon Schuhmacher, sales engineer, Boiler Water Treatment; Ray Sullivan, district manager; Russ Lang, chemical engineer; and William "Bill" Foster, service engineer.

The Hagan Force in Southern California

Ray Sullivan, district manager of the Hagan Corporation, announces that new offices were opened recently at 225 North Avalon Boulevard, Wilmington, California, to facilitate the handling of the rapidly increasing business in that territory of Hagan combustion control and boiler water treatment.

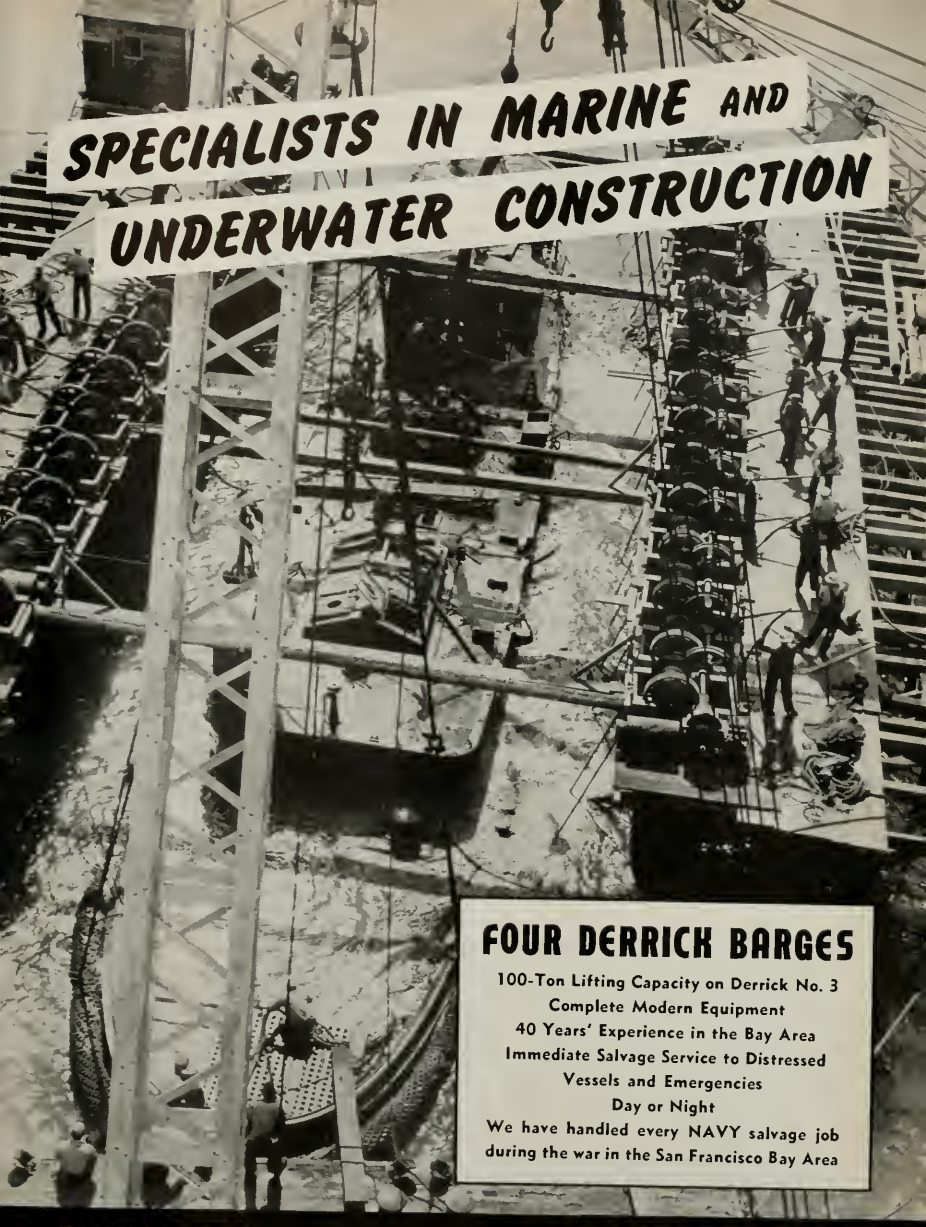
Sullivan also reports that Joe Shafer, a former member of the Hagan organization, who for the past three years has been serving on a Naval Auxiliary in the Pacific, has recently returned to active duty with the Hagan organization.



Victor A. Lepkey, War Production Board Citation winner and machinist supervisor at Bethlehem Steel Company's San Francisco Yard, machining the crank pins on a crankshaft.

Machinist Supervisor Receives Citation

When **Victor A. Lepkey** received a Citation from the War Production Board on September 24, employees of Bethlehem Steel Company's Yard in San Francisco attained top honors among the Nation's shipyards for production suggestions. W.P.B. Regional Director Edward L. Turkington reports that only three individual Citations, which represents the highest honor bestowed for production suggestions, have been made to shipyard employees throughout the nation and employees, at Bethlehem's San Francisco Yard have won two of them.



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U. S. Maritime Service Officers' School
OF ALAMEDA



December Class, 1945 Engineering Officers

SECTION 5121-E: First row, left to right: John Wyllie, Harold Snow, Thomas Ruddy, Lieut. August Sairanen (Section Officer), Earl Smithson, Cyril Barnett, Jules Chourre. Second row: Harold Jones, James McCollum, Dayton Maltby, Thomas White, William Davis, Burton Johnson, Roland Squires. Third row: Gerald Carlton, John Hokenson, Howard Winterhalder, William Smock, Vernon Cole, Robert Gilson, William Tracy. (Ross Lutz, Thomas Mahoney, absent.)

SECTION 5122-E: First row, left to right: Sidney Donzis, Charles Russell, Edwin Smith, Ensign William Shaw (Section Officer), John Robert, Lawrence Gustafson, Willard Frazee, William Shafer. Second row: Wilson Winne, Joseph Weber, Lewis Schoentrup, Joseph Sheets, Joe O'Kelley, Howard Ibach, John Williams, William Walters, James McDonald. Third row: Lester Utz, Harry Clark, Francis Flynn, Stanley Abbott, Carl Lindstrom, Forrest Hisey, Carl Young, Eugene Travaglio.





SECTION 5123-E: First row, left to right: Donald Mortenson, George Boyle, James Newhouse, Lieut. Robert Roy (Section Officer), Robert Wertz, MacDonald Caldwell, Norris Nations. Second row: George Cantrell, Horold Edwards, Ted Liebowitz, Larry Kitchen, Richard Snake, Reece Hillman. Third row: Richard Kalb, Leland Feese, Jesse Felder, Carleton Orr, Leon Aiken, John Kelly, Richard Natvig.

December Class, 1945 Deck Officers



SECTION S121-D: First row, left to right: Frank Hall, Lynn Gowan, Gerard Beaudain, Ensign Merlin McKee (Section Officer), Donald Kelley, Emil Saporiti, Charles de Pfyffer. Second row: Wallace Wade, Ray Johnson, Robert Stark, Edward Laurie, Phillip Haney, Harden Gatewood, Ray Nelson, Frederick Bennett, William Johnson. Third row: Arthur Callaghan, Samuel Peterson, Gordon Petersan, Gene Jackson, Michell Abramson, Francis Yakel, James Kennedy, Kenneth Kellagg, Edwin Carroll, John Whiteside. (Robert Safer, Hector Felix, absent.)



SECTION S122-D: First row, left to right: Bruce Brown, Daniel Brack, Wai Seto, Lt. (jg) Robert Campbell (Section Officer), Robert Yachim, Haward Jeanson, Harrell Bentley, Francisco Barrera. Second row: James Trear, Jack Tetard, Marian Crause, Robert Bradford, Richard Benthin, Robert Randall, Keith Jacobs, James Pflueger, Mervin Kovich. Third row: Arthur McDonald, Benjamin Crabarger, LeRay McCune, Frederic Wardwell, Andrew Cunningham, Harvey Snider, Grant Oberwitte, Edward Taylor, Jack Merit. (Gervase Browne, absent.)



SECTION S123-D: First row, left to right: Charles Radriques, Jack Richardson, William Millet, Lt. (jg) Lloyd Van Camp (Section Officer), Travis Harber, Lawrence Fletcher, Kenneth Kranquist. Second row: Cliffard Neth, James Edwins, Ronald Hunter, Earl Wordsworth, Jerome Konkel, Everett Schlader, Earl Painter, Edgar Squires. Third row: Frank McLaughlin, Ranald Baird, Edward Delger, Felix Cooper, Donald Barr, Charles Jett, Don Carrie, Richard Markey.

Hoist Hooks—Old and New

By Alexander MacPhedron

Naval Architect, Asst. Director, U. S. Maritime Commission

The hook is one of man's most useful devices and one of the most ancient. Man's own fingers are the most primitive form of the device. A hook still remains a hook, however, and, in general, little development has taken place. Simple it is in principle and appearance, yet an intricate calculation is required to design mathematically for a given load.

A hook is primarily designed so that the load is taken on the geometrical center (Fig. 1). While the load is thus imposed, the hook is in stable equilibrium, but when the load is displaced from any cause toward the opening, such as by deflection, sway or impact, there is a great change in the situation (Fig. 2).

The stress is much intensified and the risk of the load's jumping the hook is much increased. As an illustration of the principles governing the stresses on a hook, let us suppose a hook constructed from plates (Fig. 3). It will be noted that the hook thus made is of the nature of a cantilever suspended from a cantilever. The conventional cantilever has a rigidly fixed, built-in end, but the cantilevers shown have a small degree of fixity, and little resistance, comparatively, against turning around their points of support.



FIG. 1



FIG. 4



FIG. 2



FIG. 5

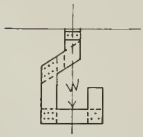


FIG. 3



FIG. 6

Suppose, however, we take the hook shown in Fig. 3 and insert a tie; the whole picture is changed. We have now, in effect, a beam positively supported at both ends, with great reduction in stress and an increase in stability (Fig. 4). This latter effect is exactly that provided by the A CLC safety hook (Fig. 5). These hooks are so devised that when the deflection point is reached the safety tie comes into play supporting the point of the hook and imparting the safety measure before mentioned.

It is an ancient practice to "mouse" a hook by passing several parts of rope around it (Fig. 6). This mousing provides a measure of support to the hook and a precaution against the sling jumping the hook. At its best, however, this device is unsatisfactory due to various causes, such as stretch of the rope. Its application consumes time and it is entirely impracticable for regular handling of loads, such as in loading and discharging cargoes.

The A CLC safety hoist hook, on the other hand, automatically engages and disengages as the load is applied and released, respectively. Entirely automatic and simple in operation, it provides just as rapid handling and a higher degree of safety than the common cargo hook. Because of the A CLC hook's patened shoulders and lip, the load is distributed between these two points. Results—wide safety margin; load won't shift even if the bolt shears. This hook will find favor with progressive persons responsible for lifting operations, and will yield dividends in the form of preventing accidents and providing ease of mind.

GE Consolidates Federal and Marine Divisions

Left to right: F. C. Ruling, assistant manager of Washington, D. C., office; W. H. Wild, manager sales, Schenectady; and E. K. Henley, manager of new Divisions, Schenectady.





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Shoreside Personalities



Left to right: Captain Henry T. Jewell, USCG, and Captain Kenneth K. Cowart, USCG.

Captain Jewell Heads M. M. Division at USCG Headquarters

Captain Henry T. Jewell, USCG, has been appointed chief of the Merchant Marine Personnel Division of the Coast Guard, succeeding Captain Kenneth K. Cowart, USCG, who has been assigned to sea duty as Commanding Officer of the USS Admiral E. W. Eberle. Announcement of the change was made at Coast Guard Headquarters, Washington, D. C.

Captain Jewell, a veteran of twenty-one years in the Coast Guard, reported to Coast Guard Headquarters in his present capacity after leaving London, where he was Senior Coast Guard Officer, Europe.

Captain Cowart graduated from the Coast Guard Academy in 1926. He later attended a two-year post graduate course at the Naval Academy, and received his present commission on August 1, 1943. Captain (then Commander) Cowart was awarded the Silver Star Medal for gallantry and intrepidity in action as Engineering Officer of the cutter Campbell on February 22, 1943, when an enemy submarine was severely damaged and sunk, and during the ensuing period when the Campbell, which was damaged, was towed safely into port. Shortly thereafter, he was appointed Commanding Officer of that vessel. Prior to leaving his post at Coast Guard Headquarters, he had been a member of the Merchant Marine Council.

Burton to Head C G Detail in India

Capt. Watson A. Burton, USCG, has been relieved of all duties assigned him as Executive Assistant Air-Sea Rescue Officer, U. S. Coast Guard, Washington, D. C., and has been assigned to Calcutta, India, as Senior Coast Guard Merchant Marine Detail Officer of the India-Ceylon-Burma Area, relieving Commander Julius E. Richey, USCG. Announcement of the change was made at Coast Guard Headquarters.

Captain Watson A. Burton, USCG





Colonel Thomas G. Plant.

Colonel Plant Returns To American-Hawaiian

Thomas G. Plant, vice president of American-Hawaiian Steamship Company, has resigned from the U. S. Army and resumed his duties with the company in San Francisco.

At the outbreak of war Plant had been a reserve officer in the U. S. Navy for fourteen years, but because of accident, he was unable to report for duty.

During his convalescence, upon the request of the U. S. Army staff, he was released from his Navy commission, and assigned to a special mission in Australia to lead and organize all water transportation for General Douglas MacArthur.

Due to conditions in the Pacific Area at that time he flew across the Atlantic, from Natal, S. A. to Africa, on to Cairo, Karachi, Bombay, Colombo, and Melbourne, where he established himself at MacArthur's headquarters. He eventually moved up to Sydney and Brisbane as the offensive progressed. Among his fellow passengers on this memorable trip, which took seven weeks instead of the usual ten days, were General Joseph Stilwell and staff, and Claire Booth Luce.

His duty in this South Pacific war theater occupied two years and two months; and his experiences in that area are a story of American resourcefulness, ingenuity and improvisation.

On his return to the United States he was assigned to Washington, for a period of four months, and then transferred to San Francisco Port of Embarkation as Deputy Port Commander for Operations.



TUNA! No Time To Waste!

Time is vital to these men. Their job is to get to profitable tuna waters as quickly as possible, devote all their energy to fishing when the run is on, and get back to market with every pound caught. For these days all the fish the industry can produce is needed.

To make a profitable haul, a tuna vessel may have to run all the way down to the West Coast of South America.

Perhaps that's why the designer and well-known Pacific boat builder, Anthony Martinolich, specified Sperry equipment aboard his new super tuna clipper, *Pan American*. He knew that on this long run the fastest time could be made by steering straighter courses.

With the Sperry Gyro-Pilot at the rudder and the Sperry Gyro-Compass in command of the course, the *Pan American* can make her cruise in record time. Not only is *time* saved, there is a double economy—*fuel!*

Besides automatic steering with "Metal Mike," the Sperry Steering System permits hand-electric and emergency-hand steering through shafting and cable. An Electric Rudder Indicator provides a positive indication of rudder position at all times. Two 12-inch Incandescent Searchlights complete the Sperry equipment aboard the *Pan American*.

If you're thinking of new ships, remember that Sperry equipment can help make them more profitable.



The 149' 8" super tuna clipper Pan American, fishing for Sun Harbor Packing Company, of San Diego, has Sperry Gyro-Compass, Sperry Gyro-Pilot, Sperry Steering Engine, Sperry Searchlights, and Sperry Electric Rudder Indicator equipment.

Sperry Gyroscope Company, Inc. GREAT NECK, N. Y.

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GYROSCOPICS • ELECTRONICS • RADAR • AUTOMATIC COMPUTATION • SERVO-MECHANISMS

Shoreside Personalities



Charles E. Printz

(This photograph was mislabeled in our last issue.)

SALES MANAGER AT SHARPLES: G. J. Keady, executive vice president of the Sharples Corporation, centrifugal and process engineers of Philadelphia, with representatives throughout the world, announces the appointment of **Charles E. Printz** as sales manager.

Mr. Printz, up until the outbreak of war, was connected with the Export Division of the company, and was in charge of South American sales. He returned to the United States in 1942, where he has functioned in the Production Department and as director of Purchases of the company.

NEW ASSISTANT SALES MANAGER AT COMBUSTION: Robert M. Hatfield has resigned as deputy vice chairman of the War Production Board to become assistant general sales manager of Combustion Engineering Company.

A mechanical engineering graduate of Purdue University, Class of 1932, Mr. Hatfield came with Combustion Engineering Company in 1934 as a student engineer, subsequently serving in the Service and Erection Department, the Proposition Department and then as sales engineer in the Cleveland Office. In



Robert M. Hatfield, new assistant general sales manager of Combustion Engineering Company.

1942 he went to Washington as chief of the Boiler Section of the Power Branch, WPB, under J. E. Krug and later became Director of the Production Scheduling Division, and then Deputy Vice Chairman for Production.



Elmer Lehmkuhl, sales manager, Dynamic Air Engineering, Inc., Los Angeles.



Charles H. Morse, III, vice president of Fairbanks, Morse & Co.

CHARLES H. MORSE III, president of the Inland Utilities Co. and assistant general manager of the Beloit Works, has been elected Vice President of Fairbanks, Morse & Co., according to an announcement by Col. Robert H. Morse, President.

Mr. Morse will be in charge of research patents, traffic, the company's western pump division, and the Inland Utilities Co., Fairbanks-Morse subsidiary with properties in 41 cities and towns in Colorado, Kansas and New Mexico. His headquarters will be in Chicago.

ELMER LEHMKUHL, formerly associated with Propellair, Inc., and the Master Electric Company, Dayton, Ohio, has been appointed sales manager of Dynamic Air Engineering, Inc., Los Angeles. "Mr. Lehmkuhl will be responsible for Dynamic Air Engineering sales to original equipment manufacturers," stated Mr. Harry Glascock, president.

Dynamic Air Engineering manufactures modern, high-pressure, axial flow blowers of 2" to 60" diameters available in single, double and triple stage set-ups for direct or belt drives. Mr. Lehmkuhl's eight years with Propellair, Inc., as service manager, and his five years with the same company as their sales manager, plus two years of experience with the Master Electric Company, provides him with a broad background of experience in assuming his new responsibilities.



To solve tough refrigeration problems!

You will gain time, save a lot of trouble on marine refrigeration installations with this two-way help... G-E equipment, G-E experience.

The equipment? G. E. designs and builds all major items for ship and yard applications ... co-ordinates and delivers complete systems. The G-E line includes condensing units, refrigerant compressors, receivers, cooling and heating coils, necessary fittings, and accessories.

The experience? Today on hundreds of ships G-E installations save premium space, protect precious cargo, reduce maintenance. Applications of marine refrigeration include food storage on emergency floating power plants, ice cream freezers and storage cabinets on Navy combat vessels, from battleships to submarines!

This, added to long years of research in the design and use of refrigeration equipment for *every* purpose, can solve just about any problems you meet. It's the know-how *and* show-how you want in planning new construction, replacement or reconversion.

A free booklet describes what G. E. offers for marine refrigeration and air conditioning. Send for a copy today.

General Electric Company, Air Conditioning Department, Section 55912, Bloomfield, New Jersey.

BUY ... and hold ... VICTORY BONDS

GENERAL ELECTRIC

Marine Refrigeration

SHIP OPERATORS AND SHIPBUILDERS

CAN YOU USE A MAN WITH 29 YEARS EXPERIENCE?

Because present contracts will be completed about January 1, 1946, I am looking for new connections on the West Coast at that time. If you can use an active man, college graduate, with 29 years ship building and ship repair experience on all kinds of Navy and Merchant ships, from subs to airplane carriers and tugs to ocean liners, a man who has been a supervisor of this work for 28 years and who can furnish first-class references, write to —

Box 116
Pacific Marine Review
500 Sansome Street
San Francisco

Shoreside Personalities

WEYERHAEUSER APPOINTMENTS: Erik Krag, executive vice president, Interocean Line, recently announced the following appointments to handle the affairs of the Weyerhaeuser Line, agents for the Pacific Coast Direct Line, Inc., Walter Wilkinson, Los Angeles district manager; R. D. Kingsbury, traffic manager of Intercoastal service at Los Angeles; Edward Walker, traffic manager at San Francisco, and D. M. Kellogg, traffic manager at Seattle. R. G. Jubitz, now in the Navy, is expected to be back on the job after his release and will be located in Portland in charge of traffic.

THE INGALLS SHIPBUILDING CORPORATION

PASCAGOULA, MISSISSIPPI

REQUIRES SERVICES OF EXPERIENCED MARINE LEADERMEN AND DRAFTSMEN FOR HULL, MACHINERY, ELECTRICAL AND SCIENTIFIC DEPARTMENTS.

APPLY CHIEF, ENGINEERING DIVISION



Captain Albert C. Lanteri, USNR, who has returned from the Navy to the Marine Sales Division of The Texas Company.

CAPTAIN LANTERI RETURNS TO TEXACO: The Texas Company announces that Captain Albert C. Lanteri has returned to his former position as chief engineer in the Marine Sales Division, New York City, after three years honorable service in the United States Naval Reserve.

WEBER BECOMES NEW DIRECTOR OF SHIP DISPOSAL. Appointment of William A. Weber as director of the Division of Vessel Disposal and Government Aids, to succeed John J. Miller, has been announced by the U. S. Maritime Commission.

Since 1937, Weber, first with the rank of lieutenant and then lieutenant commander, served as Assistant to Vice Admiral Howard L. Vickery, vice-chairman of the Commission. He early won friends among Pacific Coast shipbuilders and business leaders during the frequent trips to the Coast with Admiral Vickery, and was one of the most popular of the Washington executives doing business with West Coast yards.

CLIFF BUELL RETURNS TO McCORMICK AS GENERAL FREIGHT AGENT: Coincident with the resumption of intercoastal service, Pope & Talbot-McCormick Steamship Division at San Francisco announced, through its executive vice president, Charles L. Wheeler, the appointment of Cliff L. Buell as general freight agent for the East Bay area and the Santa Clara Valley, with headquarters at Oakland.

ELECTED STERLING ENGINE DIRECTOR! Addison F. Vars, president Sterling Engine Company, Buffalo, has just announced the election of Lewis G. Harriman, president of The Manufacturers' and Traders Trust Company of Buffalo to his Board of Directors. Mr. Harriman has been closely associated with development of the company for more than 20 years, and his wide experience in the financial and industrial development of Niagara Frontier eminently qualifies him to help guide in the post-war expansion program of the company now under way.

MAJOR REGINALD V. GRADY, son of Dr. and Mrs. Henry F. Grady of San Francisco, has been released to inactive duty by the Army after more than four years of service, three of which were spent overseas. Major Grady served in Egypt, England and later in Italy at the Allied Forces headquarters. In recognition for outstanding service as Industry and Commerce Officer for Italy, Major Grady recently was appointed an honorary member of the Most Excellent Order of the British Empire.

KLAVENESS LINE RESUMES SERVICE: Sudden & Christenson, Incorporated, general agents on the Pacific Coast for the Klaveness Line, announce that the line has berthed the MS Somerville to sail from Portland, Puget Sound, Vancouver, San Francisco and Los Angeles in the second half of December.

Ports of call in the Orient are Manila, Iloilo, Cebu and Hongkong.

TO STIMULATE EXPORTS AND IMPORTS between Portland and the Islands, an Hawaiian trade bureau has been established by the foreign trade and commerce department of the Chamber of Commerce. Frank Clark, assistant manager of the department, has been named secretary of the bureau and announces that plans are underway for a survey which may include a trip to Hawaii sometime in 1946.



C. J. Daubenberger, head of The Dauby Equipment Company, Los Angeles.

A New Marine Equipment Firm

The formation of a new corporation, The Dauby Equipment Company, Los Angeles, Calif., dedicated to the manufacture, sales and service of marine remote controls, has been announced. This firm is headed by **C. J. Daubenberger,** formerly associated with Adel Precision Products Corporation, who as an engineering technical representative served with the Army Air Forces in the Alaskan-Aleutian Area in order to alleviate the remote control troubles experienced on rescue boats and in aircraft. The Vice President is MacNeal Pierce, co-owner of the Plastic and Rubber Products Company. Edwin W. Taylor, well-known corporation attorney of Los Angeles, is secretary-treasurer. Patent attorneys are the firm of Harris, Kiech, Foster & Harris. J. C. Leigh, Jr., chief engineer, was formerly associated with Consolidated-Vultee, and R. W. Lopez, vice president in charge of production, was formerly associated with the Army Air Forces.

The remote controls to be manufactured and distributed by this firm are trade-named BOS'N'S MATES and include throttle, power clutch and power steering controls of the non-automatic, direct hydraulic type.

Atlas Changes

A. C. FRIES is now in charge of the newly opened Portland office of the Atlas Imperial Diesel Engine Company, located at 1631 N. W. Thurman Street.

J. H. Czock, formerly with the company in Vancouver, B. C., is now in charge of the San Francisco office.



Here's Where We fit into the Picture!

TO THOSE FIRMS interested in representation in the Pacific Northwest, Alaska, Asia and countries beyond the Pacific, Commercial Iron Works has a comprehensive service to offer.

For almost three decades CIW's Know-How has become a by-word in this area. Today we have these facilities to offer: A complete staff of designers and engineers; unparalleled construction facilities; an efficient assembly and installation organization; a growing sales and service department!



The Story of CIW's Know-How And What It Can Do For You . . . is told in this 48-page book. A note on your company letterhead will bring it to you by return mail so you may see for yourself where we fit into your picture!



COMMERCIAL IRON WORKS
PORTLAND, OREGON

Contractors, Fabricators, Engineers, Machinists, Founders, Shipbuilding, Marine Repairs, Drydocking

SHORESIDE PERSONALITIES



E. O. Spencer, resident manager in San Francisco of The Darcoid Company.

THE DARCOID COMPANY, manufacturers of quality packings and gaskets of all types for marine and industrial uses, are opening a direct factory branch in San Francisco at 249-9th Street.

E. O. Spencer, who is in charge of the San Francisco branch as resident manager, is an old hand at this type of business, having been intimately identified with the engineering, manufacturing and application of packing and mechanical rubber. Aside from the packing angle, Mr. Spencer is well qualified to act as consultant on power transmission problems, having specialized in V-belt and conveyor belt applications for many years.

IN LINE WITH GENERAL EXPANSION of its sales and production facilities, W. M. Binford, long prominent in the insulation business in the West, has just become associated with Marine Engineering & Supply Company and has been elected vice president of that firm, Larry Hanson, president, announced. Mr. Binford was formerly assistant vice president and district manager of Plant Rubber & Asbestos Works, a wholly owned subsidiary of Paraffine Companies, Inc.

Marine Engineering & Supply Company is one of the leading concerns in the insulation field in Southern California. During the war, Marine insulated over 500 ships of every description, $175,000,000 of high octane plants, and a wide variety of other jobs for industrial plants, housing projects, refrigeration, and rubber plants.



C. G. Cox, Pacific Coast manager of heavy machinery division of Nordberg.

NORDBERG MFG. COMPANY ANNOUNCES the appointment of C. G. Cox as Pacific Coast manager of its Heavy Machinery Division for such Nordberg products as diesel and steam engines for marine and stationary service, mine hoists and compressors. Mr. Cox is well known to users of diesel equipment particularly on the Pacific Coast because of his years of association with the diesel engine industry. He will be located at the present San Francisco office of Nordberg, at 55 New Montgomery Street.

HALPERN COMES TO WEST COAST. The Gotham Instrument Company, manufacturers of industrial, recording and controlling thermometers, have assigned Charles Halpern as regional manager for the West Coast. He has been associated with the company since 1931, and his activities were interrupted four and one-half years ago when he joined the armed forces. He was formerly assistant sales manager on the Eastern Coast, and he will now operate from the Gotham branch factory, 591 Mission St., San Francisco.

ASSOCIATED RESEARCH, INC. SALES MANAGER: Associated Research, Incorporated, Chicago, Illinois, announces the appointment of L. G. Snyder as sales manager in direct charge of all sales and advertising for the corporation.

Widely traveled, and experienced in all phases of instrumentation and testing, the addition of Mr. Snyder to the staff of Associated Research, Incorporated, will greatly improve the facilities of this organization to care for all types of measuring problems.



GUEST AND SPEECH AUTHORITY

Noyes MacCabe, radio commentator par excellence, spoke at the November meeting of The Women's Organization for the American Merchant Marine on "World Today a la Carte."



REMOVES SOOT & FIRE-SCALE

WHILE BOILERS OPERATE

CHIPPING AND SCRAPING IS UNNECESSARY when you use XZIT. Simply feed XZIT into the fire-box while the boilers operate. When thrown on the fire in a furnace it forms a gas which permeates all parts of the boiler, the uptakes, and the stack and has a chemical reaction on the soot and fire scale.

XZIT can be used to extinguish stack fires and to stop sparking. Regular use keeps boilers and stacks clean and free of soot and fire-scale.

Used by all types of merchant and naval ships, XZIT is a proved product. Write for demonstration or order a trial supply. There is an XZIT representative near you.

XZIT FIRE SCALE & SOOT ERADICATOR

1031 CLINTON STREET, HOBOKEN, N. J.
5800 S. HOOVER, LOS ANGELES, CALIF.

Demonstrating
BRICKSEAL
REFRACTORY COATING



Brickseal provides a crackproof, vitrified armor for furnace linings. The small firebricks shown in the furnace were bonded and painted with Brickseal and heated to 2250°. Directly from the furnace they were plunged into cold water as shown below—a test for *any* material subject to expansion and contraction.

Brickseal is *semi-plastic when hot*, yet *hard and tough when cold*. Brickseal is made in grades suitable to heats ranging from 1400° to more than 3000°. It will make any furnace last longer by giving new life to your refractories. Write or call local dealer for a demonstration.



BRICKSEAL
REFRACTORY COATING

5800 S. Hoover St., Los Angeles, Cal.
1029 Clinton St., Hoboken, N. J.



SHORESIDE PERSONALITIES

APPOINTMENT OF HAROLD K. CHERRY as assistant district manager of Luckenbach Steamship Co., Inc., and promotion of ROY R. STEELE to the position of marine superintendent have been announced by Robert E. Piper, district manager. Cherry, now with the FEA, has spent over 15 years in the shipping business. During the war he served in the office of defense transportation, and at present is chief of the northern division for the foreign economic administration.

Steele, for 16 years with the company, will have full charge of stevedoring and ship operation. For several years he has been pier superintendent for Luckenbach.

CHAIRMAN JOHN H. BURGARD of the Portland Dock Commission has announced the appointment of George D. LaRoche as general manager for the commission, effective January 1. Mr. LaRoche, for years active in shipping and port circles, has been attorney for the Dock Commission since 1928.

He will continue to act as attorney and counsel in addition to his managerial duties.



George J. Sussman, traffic agent, Bethlehem Steel Company, promoted to District Traffic Manager.

GEORGE J. SUSSMAN, traffic agent, Bethlehem Steel Company, has been promoted, effective November 1, to the position of district tra°c manager, Bethlehem Steel Company, with headquarters at San Francisco, and having jurisdiction over suboffices at Seattle, Washington, and Los Angeles, California.

Frank Hubert, Jr., until recently attached to the Houston Traffic Department of the Bethlehem Steel Company, has been appointed traffic representative with headquarters at Los Angeles, where he will assume his duties November 1.

HAROLD DE GOLIA, Cunard White Star Line's popular agent with headquarters in San Francisco, received the news of the appointment of E. Seymour Bell as assistant general manager for the company with headquarters in New York. Bell has been identified with the shipping business for thirty years.

During the war, he was one of the first members of the British staff sent to the United States. He served as head of the Movements Branch of the British Army in the United States and Canada, and in addition, was director of exports of the British Ministry of Supply Mission.



Fred C. Smith, Director of Quality at Tube Turns, Inc.

FRED C. SMITH was appointed Director of Quality at Tube Turns, it was announced by Harry G. Howell, vice president in charge of production of Tube Turns, Inc., Louisville, Ky.

A native of Marion, Ind., Mr. Smith acquired his B.S. and Ch.E. degrees at Purdue and began his administrative career as plant metallurgist with International Harvester in Fort Wayne and Chicago. Prior to joining Tube Turns in January, 1943, as chief metallurgist, he was field metallurgist for Carnegie-Illinois.

ALLEN C. BROWN, former major in the Army Transport Service who served during World War II as liaison officer for the War Shipping Administration and San Francisco representative of the Governor of Hawaii, has joined the Matson Navigation Company as assistant Freight Traffic manager.

Brown, whose appointment was announced by M. F. Cropley, Matson Freight Traffic manager, is a native of Honolulu. He worked closely with Matson during the war in coordinating cargo shipments between the Pacific Coast and Hawaii. He succeeds Eugene H. Hurst, who recently retired due to ill health.



Allen C. Brown, Matson Navigation Company, assistant freight traffic manager.

"Headquarters at the Harbor!"

J. M. COSTELLO SUPPLY CO. "On Deck and Below"

BETHLEHEM —Wire Rope

THE GARLOCK PACKING CO.

LESLIE CO. { Pressure Regulating Valves "Typhon" Whistles

ATLAS MARINE PAINTS

MARINE ELECTROLYSIS ELIMINATOR CORP.

NEW YORK BELTING and PACKING CO.—Air, Fire, Water and Steam Hose

TODD COMBUSTION EQUIPMENT CO.

TUBBS CORDAGE COMPANY

GOODYEAR "DEKTRED"

XZIT Soot Eradicator

BRICKSEAL Refractory Coating

DESCALING CHEMICALS and SOLVENTS

PAXTON MITCHELL Metallic Packing

ENSIGN Products

J. M. COSTELLO SUPPLY CO.

MARINE SPECIALTIES

221 No. Avalon Blvd., Wilmington, Calif. Phone Terminal 47291



Harold Starr, assistant to operating manager, McCormick Steamship Company.

GEORGE LIENHARD, in charge of service and installation for Nordberg on the Pacific Coast, will continue in that capacity with the same headquarters.

Sales and service for the Crusher Division of Nordberg remains at its present location in the Subway Terminal Building, Los Angeles, under the jurisdiction of T. D. Davis, Pacific Coast representative of this division.

THE MARINE INSURANCE FIRM OF MATHER, LTD., 49 Wall Street, New York City, announces that Lieutenant Commander Charles D. Hodges, Jr., recently with the Division of Small Vessel Procurement and Disposal, War Shipping Administration, Washington, D. C., is to be an associate of the firm.

Previous to joining the United States Coast Guard Reserve, shortly after the outbreak of the war, Commander Hodges was vice president and treasurer of the firm of Andrew B. Sides & Co., Inc., steamship operators, agents, importers and exporters. He was also connected with the War Shipping Administration in the requisitioning of vessels for military use.

In March, 1944, he was assigned to the Assistant Commandant, U. S. Coast Guard, and detailed to the Division of Small Vessel Procurement and Disposal, where he has served until his recent return to inactive duty.

Besides insurance work with Mather, Ltd., Commander Hodges is to be actively engaged in vessel brokerage and chartering.



Charles D. Hodges, Jr., now with marine insurance firm of Mather, Ltd.

PREVENT
ROD SCORING,
save power

"Full-floating" FRANCE rings in metal cases make a snug seal and compensate for rod deflection or misalignment—the ideal packing for piston rods and valve stems in any type of engine, pump or compressor. Wears as long as any other working part of the engine—saves power and prevents costly power shutdowns.

There is a time-tested FRANCE Packing design for steam, air, gas and crankcase oil service under any condition of speed, pressure or temperature. Recommended and used for years, the world over — Standard Packing of the Industry.



Write for Catalog M 6

FRANCE PACKING COMPANY
PHILADELPHIA 35, PA.
Representatives in Principal Cities

Kings Point Pays Dividends

Ninety-two per cent of the 7000 graduates of the U. S. Merchant Marine Cadet Corps and its Academy at Kings Point are serving as officers of ships. This is believed to exceed the record of any other Federal sea service academy, Captain Edward Macauley, USN (Ret.), Deputy Administrator, War Shipping Administration, announced.

More than 1700 graduates are on active sea duty as officers with the U. S. Navy and 4800 are attached to merchant vessels.

Less than 2½ per cent of the graduates of the nation's newest service Academy are on shore duty and they are attached to War Shipping Administration Training and Foreign Service units, according to a report made to Captain Macauley by Commodore R. R. McNulty, USNR, supervisor, U. S. Merchant Marine Cadet Corps.

One and one-tenth per cent of the Academy graduates have been lost or missing in action, prisoners of war or physically disabled as a result of the war.

The report showed that since the U. S. Merchant Marine Cadet Corps was established in 1938, 7083 officers have been graduated. A breakdown of information available on 6800 graduates shows 6550 at sea, only 170 ashore and 80 war casualties. The Cadet Corps can account for 96 per cent of all its graduates since 1938.

Ninety-one graduates are now ships' masters and 77 are chief engineers. Grace Line, Inc., leads with 15 graduates serving as masters, American Export Lines with 14 as chief engineers. Of the 1700 on active duty with the Navy, 61 hold the rank of Lieutenant Commander or higher.

An additional 150 Cadet-Midshipmen, before graduation, lost their lives or are missing in action.

Reception For Commodore Dreany

An informal reception was tendered recently at San Francisco's Commercial Club to Commodore H. H. Dreany, assistant commandant of the U. S. Maritime Service, by members of the shipping industry and several staff officers attached to the Pacific District Headquarters.

Present to assist in greeting the Commodore were Hugh Gallagher, vice president of the Matson Navigation Company; Gene Hoffman, secretary-treasurer of the Propeller Club; Joe Moore, Jr., president of the Propeller Club; Captain Malcolm W. Crossman, superintendent of the Maritime Service Licensed Officers School, Alameda; Captain H. J. Tiedemann, Pacific District Operations Officer of the Maritime Service; and Commander A. W. Beale, Training Officer for the Maritime Service.



THE COIL of ATOMIC ENERGY

Backed by 141 years of manufacturing experience, **FITLER ROPES** are known for their strength, durability, water-repellency and flexibility.

THERE IS NO SUBSTITUTE FOR QUALITY

THE EDWIN H. FITLER CO.
Established 1804
5625 Tacony Street
PHILADELPHIA 24, PA.

Interocean's Managerial Appointments

R. W. CABELL, vice president, is to be in charge of European and Intercoastal services.

He joined the Interocean family 15 years ago as manager of the Columbia River district, with offices at Portland. When operations of the European service were transferred to the Atlantic in 1943, Mr. Cabell took charge of the New York office and

with untiring effort, expedited a large volume of war cargoes. He will continue his work on the Atlantic Coast but later intends to make his headquarters in San Francisco.

A. H. Mortensen, vice president, is to be in charge of operations and chartering as well as North and South Pacific services. He joined the Interocean family 11 years ago and, until the war, was manager of the Oriental and South Pacific services. Since the close of the war a considerable volume of War Shipping Administration business is still in progress under his supervision. He will continue to be located at the San Francisco head office.

These are the principal lines represented by Interocean Steamship Corporation at Pacific Coast ports:

Weyerhaeuser Steamship Company—Pacific Coast Direct Line, Inc. (Intercoastal Service via the Panama Canal);

Interocean Line (Westfal - Larsen and Company, A/S, Norway) (Pacific Coast - Continental Europe);

Knutsen Line (Knut Knutsen O. A. S., Norway) (Pacific Coast-United Kingdom);

Salen Line (Sven Salen A/B, Sweden) (Pacific Coast-Philippines and China);

Agwilines (Atlantic Gulf - West Indies Steamship Co., New York) (U. S. War Shipping Administration vessels);

American Liberty Steamship Corporation, New York (U. S. War Shipping Administration vessels).

Borg-Warner Director Back From Service

Frank M. Hawley, vice president and general manager of the Morse Chain Company, division of Borg-Warner Corp., announced the appointment of **Ray P. Johnson** to be assistant to the general manager with offices in Detroit.

Mr. Johnson assumed his duties November 1, rejoining the Borg-Warner Corp., of which he has been a director since 1936. He left the organization to enter the Army more than three years ago.

In his Army career, Mr. Johnson was, respectively, assigned to the Committee for half-tracks with offices at the White Motor Co., Cleveland, in charge of Automotive Components Production Sub-Section, and a deputy chief, with rank of Major, in the Ordnance Department at Detroit.



Baldwin's New Sales Manager

Appointment of Robert G. Allen as general sales manager of The Baldwin Locomotive Works, effective November 1, 1945, has been announced by Ralph Kelly, president of Baldwin.

In 1925 he became associated with the Walworth Company holding the post of Division Sales Manager from 1929 until 1936. From 1936 to 1940 he served two terms, as Representative in the Congress of the United States.

Elected President of the Duff-Norton Manufacturing Company in 1940, he was granted a leave of absence to accept a commission as Major in the United States Army, Ordnance Department, in July, 1942. In February, 1943, he was promoted to the rank of Lieutenant Colonel, and a few months later was transferred to field service overseas as Battalion Commander and Group Commander.

Britisher Visits Pacific Coast



Sir Ronald Garrett, geniol deputy chairman of Lloyds Register, recently visited San Francisco on a world tour of Lloyds Register Surveyors offices.

TECHNICAL MODEL SERVICE

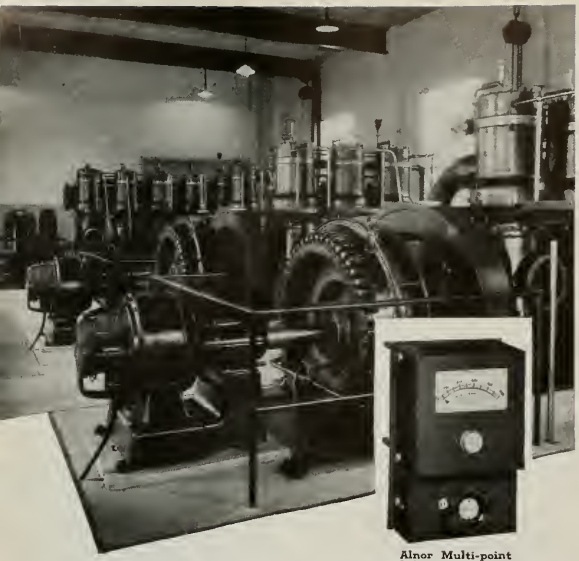
HALF MODELS . . . For the men who lay out the ship's plating.

STRUCTURAL MODELS . . . For analysis and solving problems of prefabrication.

STRUCTURAL SECTIONS . . . For visual training of personnel new to shipyard work.

LARGE SCALE MODELS . . . Fully detailed, decorated models, showing the completed ship from stem to stern, keel to topmast. A tangible record of shipyard achievement and an inspiration for all shipyard personnel.

VAN RYPER • VINEYARD HAVEN • MASSACHUSETTS



Alnor Multi-point Exhaust Pyrometer

Alnor **PYROMETERS**

the* dependable *guide to* dependable *engine performance

This successful municipal light plant operates four Fairbanks-Morse Diesels, including a recently installed unit of 1000 hp. As in so many other installations of Diesel engines where dependable performance is paramount, you will find Alnor Exhaust Pyrometers on the instrument board. These reliable pyrometers provide for easy, accurate routine check of exhaust temperatures as a guide to operation, maintenance and adjustment.

Alnor Exhaust Pyrometers are built in a complete range of types and sizes, single and multi-point, to meet the needs of installation with any type of engine, afloat or ashore. Write for special exhaust pyrometer bulletin with complete data.

ILLINOIS TESTING LABORATORIES, INC.

420 NORTH LASALLE STREET • CHICAGO 10, ILLINOIS

SHORESIDE PERSONALITIES

New F-M Distributors

In Portland

The Seattle Branch of Fairbanks, Morse & Co. has announced that the Milwaukee Machinery Co. of Portland, Oregon has been appointed exclusive distributor for the complete line of the firm's turbine pumps, including the Pomona pump and the F-M oil lubricated turbine pump. They are also going to handle service and sales for the company's Niagara propeller and Mixflow pumps as well as F-M Wesco horizontal turbine type pumps. This branch will be managed by W. H. Perry, who was with the Dallas branch of the company, and more recently, with the Westco Pump Sales Co. in California.

In Seattle

Simultaneously the Seattle branch has announced that the Cascade Machinery Co. of Seattle, Washington will handle all F-M pumping equipment including Pomona pumps and Westco pumps. This firm will also act as distributors for F-M motors and electrical equipment. The pump department is to be managed by Clyde A. Retter, formerly with F-M in Seattle.

The Service Department of Cascade Machinery Co. includes a machine and fabrication shop which can handle all types of repairs on both pumping and electrical equipment.



Gordon W. Monfort, director of the News Bureau, Caterpillar Tractor Co.

New Director Of Caterpillar News

Appointment of Gordon W. Monfort to the advertising department of Caterpillar Tractor Co., as director of the news bureau, is announced by G. M. Walker, advertising manager.

Mr. Monfort assumed his new duties October 10 upon his arrival from California where, since early in World War II, he had served as personnel director at Caterpillar's San Leandro plant.

He entered the Caterpillar organization as a member of the advertising department in 1928 but when the company offices were moved to Peoria in 1930 he remained in California to engage in business for himself as advertising counsel. In the following years he performed several special assignments for the firm and in 1937 rejoined the company as western division advertising representative, a position he held until 1941 when he became personnel director.

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Manufacturers of Marine Communication Equipment Since 1918



L. C. Fletcher, marine steam application engineer, Westinghouse Electric Corporation.

L. C. FLETCHER, marine steam application engineer, Westinghouse Electric Corporation, South Philadelphia Works, visited the Pacific Coast recently.

Mr. Fletcher investigated the operating records of the hundreds of Pacific Coast ships equipped by Westinghouse during the war period. He had a prominent part in the design and application of the geared turbines and other steam machinery for these ships.

His talks with the Navy personnel on all types of craft from destroyers to the 45,000-ton battleships brought out many experiences of operation under fire, where both the men and the machinery stood up under unbelievable operating conditions.

Mr. Fletcher feels that for large passenger ships, 850 lbs. pressure and 900 degrees maximum temperature will be approximately the accepted steam conditions for the post-war era.

Elect Luedtke to Head Pacific Traffic Association

T. F. Luedtke, traffic department, Pope & Talbot, Inc., McCormick Steamship Co., has been nominated for the presidency of the Pacific Traffic Association for the year 1946.

Other nominees selected by the association's nominating committee are:

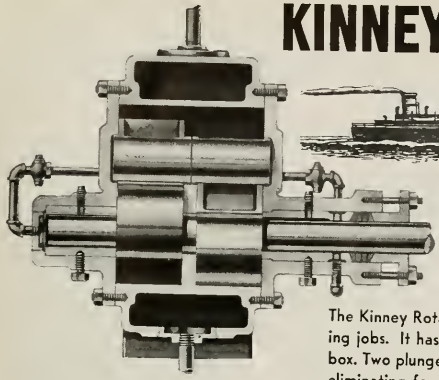
First vice president, H. A. Kern, vice president, Bekins Van & Storage Co.

Second vice president, C. J. Harbeke, general agent, Denver & Rio Grande Western R. R.

Third vice president, Robert Tuggy, regional manager, Wells Fargo Carloading Co.

(Continued on page 78)

KINNEY CARGO PUMPS





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The Kinney Rotating Plunger Pump makes light work of difficult pumping jobs. It has no valves, springs or gaskets — and only one stuffing box. Two plungers, set 180° apart, give continuous, uninterrupted flow, eliminating foaming. Displacement is positive . . . the pump is accurate as a meter.

Pump is available plain or steam jacketed for either horizontal or vertical installation . . . may be driven by gear head motor or by motor through speed reducer. Iron, bronze fitted or bronze constructions as specified. Send for Bulletin 18A.

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(Continued from page 76)

Secretary: Rudolph Illing, chief rate clerk, traffic department, Columbia Steel Co.

Treasurer: Thomas W. Harris, Jr., district traffic manager, American Tobacco Co.

Directors: Frank H. Smith, assistant division freight agent, Atchison, Topeka & Santa Fe R. R. Co.

Lloyd W. Kardell, manager, National Carloading Corp.

Charles Robbins, traffic representative, American Air Lines.

Robert K. Hunter, port traffic manager, Board of State Harbor Commissioners.

California Metal Trades Assn.

LEE W. DELHI, vice president of Western Pipe and Steel Co., one of the best known officials in shipbuilding activities on the Pacific Coast, is the new president of the California Metal Trades Association, according to an announcement by Secretary Manager, Max F. Lowe.

A. E. McINTYRE of Merco Nordstrom Company was elected vice president and **George F. Bont** of California Steel Products Company, was elected treasurer. Directors elected were: D. E. Golden, Schlage Lock Co.; Russell Gowans, Western Crown Cork and Seal Corp.; J. E. Holland, Montague Pipe & Steel Co.; Serge Kovaleff, Enterprise Engine & Foundry Co.; J. Kuttler, Trailmobile Co.; Charles E. Moore, Joshua Hendy Iron Works; P. A. Hoyt, Oliver United Filters Inc.; George H. Raitt, Steel Tank and Pipe Co.; Wesley Plunkett, Friden Calculating Machine Co.; and G. F. Twist, Atlas Imperial Diesel Engine Co.

On the Ways

(Continued)

Visit to Columbia And Snake Rivers

Under the sponsorship of the Portland Chamber of Commerce foreign trade and shipping committee, a group of Portland and Vancouver business men have just completed a tour of the Inland Empire's Columbia and Snake River port cities. The trip was undertaken in the interests of furthering trade and commerce between that area and the lower Columbia, assisting in bringing about improvements on the upper river, and encouraging the immediate construction of proposed facilities by the various port commissions.

Accompanying the party to give technical advice on engineering, construction, and trade matters were: Col. Ralph A. Tudor, U. S. District Engineer; Howard L. Waterbury, U. S. Department of Commerce; Frank Landsburg of the Interstate Commerce Commission; A. D. Merrill, chief engineer of the Portland Dock Commission; Arthur Farmer and Carter Brandon of the Chamber of Commerce; Capt. Homer Shaver, Lew S. Russell, Sr., and Capt. A. Leppaluoto, river towing and barging operators; and Frank Pender, manager, Port of Vancouver.

Cities visited included The Dalles, Arlington, Umatilla, Pendleton, Lewiston, Pasco, Kennewick and Walla Walla.

Consolidated's Third Tuna Clipper

The Lou Jean, the third all-steel clipper to be built at Consolidated Steel Corporation's Boat Division, was launched in Newport Harbor November 1.

The Lou Jean was built for Agostino Guidi of San Diego.

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Book Reviews

"Handbook of Knots" by Raoul Graumont is published by Cornell Maritime Press of New York. It is 224 pages with 43 illustrations, paper bound $1.00, cloth bound $1.75.

This is the author's fourth book on knots. As the name indicates, it is a handy pocket-size volume which illustrates and explains each of 428 knots in detail, including hitches, ties, bends, sheepshanks, bowlines, simple knots, ornamental and trick knots, mat weaves, sennit braiding, end rope knots, back splices, eye splices, short and long splices, horseshoe splices, grommets, whippings, seizings, miscellaneous knots and braids, and slings.

For extra handiness the different knots are indexed by use as well as by their names. Knots used in 48 different occupations and avocations are covered including campers, cowboys, butchers, divers, electricians, farmers, fishermen, horsemen, lumberjacks, magicians, mountain climbers, riggers, Sea Scouts, stationers, steeplejacks, tailors, teamsters, trappers, weavers, and yachtsmen.

"Lessons in Arc Welding," seventh printing, second edition, published by The Lincoln Electric Company, Cleveland, Ohio, 176 pages, 5½ x 8½ inches, 133 illustrations, including photos and drawings; cover, semi-flexible simulated leather, gold embossed; price postpaid United States 50 cents per copy, elsewhere 75 cents per copy.

"Lessons in Arc Welding" is a revised and up-to-date new printing of the second edition to assist both new and experienced welders as well as all persons interested or concerned with the subject, with complete and thorough instructions in all phases of arc welding.

The book includes 61 lessons in arc welding and has over 200 photos and illustrations to supplement the text. From "Instructions to the Operator" to the 571 examination questions and answers given in the closing pages, the book sets forth in plain simple language the practical instruction based on the experiences of Arthur Madson, head instructor in the Lincoln Arc Welding School. Mr. Madson has taught thousands of students to become practical, successful arc welding operators.

The 1945 eleventh edition of KNIGHT'S MODERN SEAMANSHIP has been put out by J. Van Nostrand Company, Inc., publishers. Price $5.00.

This book, well known to naval men for many decades, has been kept up-to-date by successive revisions. The officers of the Department of Seamanship and Navigation of the U. S. Naval Academy revised this book thoroughly a few years ago, and they have made, from time to time, further partial revisions to keep it up-to-date.

Among its valuable features are its treatment of the more recent methods in naval construction, its clear explanation of weather and weather signals, first aid methods, and the complete glossary of naval terms and definitions which have been incorporated in the book, as well as the Rules of the Road.

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Book Reviews

(Continued)

The Chemical Formulary, Volume VII, by H. Bennett, editor-in-chief. Price $6.00. Published by the Chemical Publishing Co., Inc.

Behind the contents of this new volume stand the integrity and scientific knowledge of some of America's leading industrial and research chemists. The formulae you will find in this book are the result of long years of research and millions of dollars spent on experiments. It contains new ideas and new processes, of invaluable use to the inquiring mind.

Cornell Maritime Press has published a practical "Spanish Handbook for Mariners and Travelers in Latin America." Price $3.00.

Here is a language book which is also a guide to Latin American etiquette, customs, traditions and history. Valuable hits are given on how to observe Latin American courtesies.

Travelers, business men, Americans at work in Central or South America or the Caribbean, students, language hobbyists and mariners, will find this handy book a comprehensive introduction to Latin-American Spanish as it is really spoken.

"Ship Handling in Narrow Channels" by Lt. Comdr. Carlyle J. Plummer, USCGR, and Branch Pilot, Sabine (Texas) District, is published by Cornell Maritime Press, 120 pages, pocket-size, fully illustrated, and priced at $2.50.

The problems which arise when a large ocean-going vessel is taken into shallow, narrow waters are answered in this book from the author's years of experience as pilot and ship's officer. His practical instructions will be invaluable to junior officers, as well as to experienced pilots of large ships or harbor craft.

"The Merchant Marine and World Frontiers" by Robert Earle Anderson, Director of Finance, U.S.M.C., published by Cornell Maritime Press, price $3.00.

The unofficial but authoritative opinions of the man who has held such a responsible position with the U. S. Maritime Commission for six years. He presents the history of our merchant fleet during both wars, including the period of decay of the merchant marine and the gigantic tasks accomplished by the U.S.M.C., the WSA, the shipbuilding companies, the shipping lines and the men aboard the ships, in restoring the merchant marine to the strength it is today.

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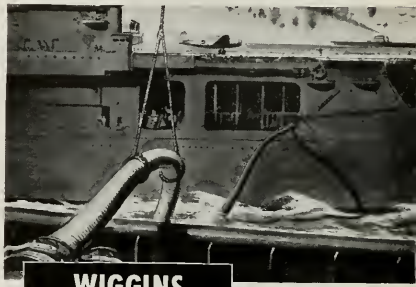
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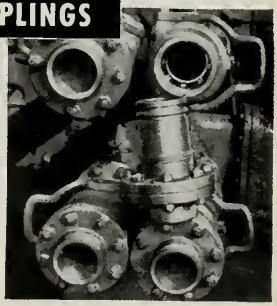
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Hot off the Press

MARINE EQUIPMENT: Catalog WP-1099, B46, published by the Worthington Pump and Machinery Corporation, comprises 340 pages of descriptive and technical data profusely illustrated, printed in two colors, and assembled in an attractive loose-leaf binder.

This volume is divided into eleven sections as follows: steam pumps; centrifugal pumps; power pumps; rotary pumps; air ejectors, condensers, and feed heaters; compressors; steam turbines; air-conditioning and refrigeration; diesel engines; miscellaneous equipment; and engineering data.

Each section is completely indexed and covers its subject thoroughly. Together with the section on engineering data, each section forms practically an engineer's handbook with particular topic.

* * *

BABCOCK & WILCOX COMPANY, NEW YORK, has recently published Bulletin 3-378 on a streamlined steam tug, the Edward J. Engel. All the structural plans and descriptive matter concerning this Joslyn & Ryan designed tug are contained in the eight-page bulletin. Credit is given P.M.R. by B. & W. in helping to compile this tug bulletin.

* * *

Graham Manufacturing Co., Inc., New York City, N. Y., have recently issued three bulletins. Bulletin B-15 covers Graham surface condensers designed for marine power plant and general industrial use, complete with photographs and tables. Bulletin No. 56 is a 34-page publication covering steam jet ejectors and thermocompressors, and explains the principle of operation of steam jet ejectors illustrated by a cutaway model. There are also comprehensive illustrations and tables. Bulletin No. 58 describes Heliflow coolers and heaters.

American Hoist & Derrick Co., St. Paul, Minn., has issued a revised edition of the Crosby Clip Instruction Booklet CCB-11B. It gives full details about the clip and contains a table of the number of clips to be used for all sizes of rope up to three inches. Also instructions illustrated with diagram and pictures are given for properly making a wire rope fastening.

* * *

"The Buyer's Encyclopedia" is a new catalog on safety equipment just published by The General Pacific Corp., Los Angeles. Complete data are included on alarms and sirens, fire extinguishers, motor fire apparatus, and allied products, as well as safety clothing and equipment, police and first aid equipment, and a variety of items suitable for industrial maintenance.

* * *

Cochrane Corporation, Philadelphia, Pa., have available a publication on Green Sand Zeolite Softeners, No. 2860-A. Power plant operators, or those interested in the production of soft water, will be interested in this informative booklet.

Paracoil
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Evaporator . . . Oil Heaters . . . Oil Coolers . . . Grease Extractors . . . Water Heaters
Distillers . . . Feed Water Heaters . . . Exhaust Gas Boilers . . . Heat Exchangers
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Hot Off the Press

Cochrane Corporation, Philadelphia, Pa., have for distribution their Reprint 39, which discusses briefly the removal of ammonia from boiler feed water. This discussion takes into account three practical methods, such as use of a deammoniator, the use of chlorine and the use of an acid-regenerated zeolite.

* * *

Byers Wrought Iron for Radiant Heating is a 52-page manual from A. M. Byers Company, Pittsburgh, Pa. It is filled with specific information supplemented by explanatory pictures and drawings. It is a practical treatise covering what has been learned about the system in hundreds of installations. It is a working handbook and should be very valuable to the competent architect, engineer, heating contractor or plumber in assisting him in the calculation, designing or installation of the system.

* * *

"High Speed Gas Cutting Tips" is a new 12-page bulletin, No. ADG-2008, describing the Airco "45" and "45M" high speed machine gas cutting tips which control the expansion of cutting oxygen, published by Air Reduction. Drawings and photographs clearly show the especially designed orifices in these tips releasing a high velocity stream of oxygen to cut a narrower path or kerf than the standard cutting tips. Other illustrations, including charts and tables, give valuable specifications data for both tips.

* * *

Eutectic Low Temperature Welding Alloys is the title of a new folder from Eutectic Welding Alloys Company, New York, N. Y. It describes applications and contains a helpful selector chart.

* * *

A complete catalog of ball bearings, roller bearings and pillow blocks, No. 440-C, has been published by Ahlberg Bearing Company, Chicago, Illinois. The catalog contains 80 pages, is clearly indexed, and has photographs of typical installations, as well as mathematical formulas for calculating bearing loads, life of bearings, etc.

An interesting new 8-page bulletin has been published by the Titusville Forge Division of Struthers Wells Corporation, Titusville, Pa., describing the company's facilities for precision forgings regardless of size, metal or alloy. Illustrated are many outstanding forgings recently produced, including a description of the company's research, engineering and plant facilities.

* * *

Thomas C. Wilson, Inc., Long Island, N. Y., have issued a folder, No. 25, on tube-cleaning operations. The booklet contains a step-by-step check list covering appropriate equipment, proper cleaning procedure, care of cleaning equipment, and a listing of types and sizes of motors, cutters, brushes, and other accessories required.

* * *

The Korfund Company, Inc., has published a 4-page bulletin describing the new type SL Korfund Universal Vibro-Isolator. The all-directional vibration-absorbing feature of the unit makes it particularly suitable for marine installations.

WEST COAST SHIPBUILDING AND DRYDOCK COMPANY

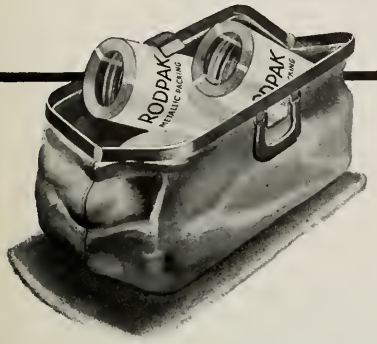
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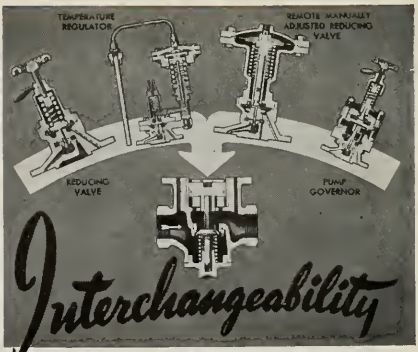
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J. E. Lonergan Company has recently released Information Bulletin No. 502-A, entitled "Pressure Safety Appliances." This pamphlet is a condensed catalog of Lonergan safety valves, relief valves, pressure gages, and specialties. It lists essential specifications in tabular form and illustrates principal design types.

* * *

A new resistor catalog of 32 pages has been issued by Ward Leonard Electric Company. It describes and illustrates various types of units, gives sizes, resistance values, mountings and enclosures.

* * *

"Safety Treads" is a new 16-page, two-color catalog, No. 45, recently published by Wooster Products, Inc. This booklet describes the two principal types of Wooster Safety Treads, safe groove and abrasive cast, and the large variety of types available. It gives suggested applications for each particular type of safety tread and information regarding the installation of safety treads on stairs, ramps, platforms, and ladders in all types of commercial, industrial and public buildings.

"Steam Jet Ejectors," Form 9013, is a new bulletin by Ingersoll-Rand Company about vacuum-producing equipment. It should be of special interest to chemical and process, food, pharmaceutical and petroleum industries. Some uses outside these fields are: evacuating tanks for treating timber, vacuum packing, deaerating of soap, etc., and producing simulated latitude conditions for testing engines, superchargers, pumps and instruments.

* * *

Oil Power Transmission for Variable Speeds is a new folder from Sundstrand Machine Tool Co., Rockford, Illinois. It lists the outstanding features and specifications and shows a cutaway model of the mechanism

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